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### PREVENTION OF WAR NEUROSES.<sup>1</sup>

By W. S. DAWSON,  
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THE subject of the present meeting would appear to be the prevention of those disabilities which can be most satisfactorily understood as having an emotional basis and in which the altered circumstances of life due to war play a major factor. Maclay and Guttman<sup>2</sup> have described neurosis as "the expression or the result of a person's incapacity to adjust himself to or overcome a particular situation in life, very often with much internal conflict". In war, as during any other threat to the well-being and still more to the existence of the herd, there occurs an enormous intensification of emotional dispositions concerning the herd, which through mass suggestion, for example, may be the prelude to highly successful concerted action, or, on the other hand, to disruptive suicidal panic. The emotional bonds which unite the individual members of a social group we term (good) morale. That good morale is essential to successful action by the herd needs no emphasis. Napoleon said that the moral is to the physical as three to one, and a British Army publication describes moral qualities as "the soul of victory". In this war we have seen the skilful sapping of morale largely by propaganda disseminated in the first instance amongst the civilian population, upon whom rests a greater responsibility than ever for the means of ultimate victory. And this propaganda in susceptible individuals and nations tends to appeal essentially to superstition, fear and distrust. "*Omne ignotum pro terribile*." What really

was, or is, Hitler's "secret weapon" except, as has been suggested, a thrust at the morale of his prospective victims? Bion<sup>3</sup> has pointed out that the Germans of today by the intensity of their propaganda, whether through loud speakers or by means of more subtle communications, have merely developed the methods used by the Germani, whom Tacitus described as uttering uncouth cries within hearing of their foes and spreading barbarous verse amongst themselves to influence their minds with the thought of victory.

Amongst all this bluster Britain is safeguarded by a proud tradition, in itself a deterrent to panic so long as it is not permitted to cloak inefficiency and complacency. British phlegm, so little understood by Europeans, may well be the most valuable of all inborn or constitutional assets in the present crisis. As a profession we can do much in the course of our everyday work to promote a balanced viewpoint in regard to current events, leaving it to our elected leaders to use more public methods of fostering the urge to win.

#### The Soldier.

With regard to the more direct part that we can play in the prevention of neurosis, we must consider first the soldier.

#### Enlistment.

The history of an attack of serious mental disorder may readily be denied by the recruit, and psychopathic symptoms of a kind which render a man unsuitable for military service are apt to appear only in special circumstances. In so far as psychoneurosis is manifested under special rather than general conditions, the possibilities of its detection in the course of ordinary medical examination are correspondingly reduced. Somewhat similar problems are presented by asthmatics and dyspeptics, subjects with neuro-circulatory asthenia, and those with symptoms following concussion. Knowledge of the fact that wilful concealment of a "mental" history may render the soldier

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on August 23, 1941.

liable to forfeiture of rights to pension in respect of a nervous illness contracted on service may deter a few psychopaths from joining the military forces.

In the course of his examination the medical officer will have to rely very largely on impressions in making his psychiatric assessment. The mentally subnormal subject may be detected when he is dull of aspect, slow in his replies and uncertain in his comprehension. His general appearance often betrays him, and it is a matter for surprise on the part of some of us who have to board these "nitwits" out how ever they came to be accepted. Other subnormal subjects of a more vivacious temperament easily deceive the examiner, and reveal their defects only in the course of training. Vasomotor and neuro-muscular instability are, of course, commonly associated with general psychopathic tendencies, but may be isolated features, in which case the recruit may be permitted to proceed to training "on probation". The medical examiner may well say with Falstaff: "Care I for the limb, the thews, the stature, bulk, and big assemblance of a man! Give me the spirit" (*King Henry IV*, Part II, Act 3, Scene 2).

This important component of the personality, temperament, can be assessed only superficially and intuitively, although a little time spent in general conversation with the man and inquiry into his economic, social and domestic history will provide some insight into his character, and may reveal psychological weaknesses which were denied in answer to direct questions about mental breakdowns. The severity of earlier psychoneurotic or functional disabilities may roughly be gauged by the extent of their interference with an average mode of life, the amount of time lost from work, and the period over which treatment was sought. Stalker<sup>(2)</sup> suggests that the names of patients of military age discharged from mental hospitals should be notified to the military authorities, that every recruit should present a summary of his medical history signed by his own doctor, and that psychiatrists should sit on recruiting boards. There are obvious difficulties about the first two of these suggestions. I have no doubt that in the course of brief interviews a physician with some special knowledge of psychoneurotic disorders could recognize instability and subnormality in a number of men who have been passed on general medical examination. The psychiatrist can perform an even more useful function by giving an opinion on subjects concerning whom his general medical colleague may have a doubt.

**Psychometry.**—By group tests of general intelligence, followed by individual tests in selected cases, the dullards can be ascertained and rejected. It will be remembered that the intelligence tests applied to the Army of the United States of America in 1917-1918 revealed some 3% of mental defectives amongst men in training, even after the more grossly affected had been rejected before enlistment. Of all recruits rejected for nervous and mental disabilities, over 30% were mental defectives. With the increasing complexity of technical devices in present-day warfare, it may safely be presumed that a man needs a mental age of at least twelve years to be able to be trained to a satisfactory standard. In the last war men were accepted in the United States Army with a mental age of eight years, but it was found that this standard was too low. The detection of superior intelligence by routine psychometry is of less value than the quick rejection of the subnormal recruits, since the good brain should assert itself. If the bright intelligence remains unexpressed, there is something wrong with the soldier's character. Unfortunately, no reliable or readily applied tests of temperament have yet been devised, and most of those in general use consist of *questionnaires*. A few questions concerning temperament and nervous instability added to the group tests of intelligence might elicit some useful information. On the other hand, questions on such topics might be answered irresponsibly, if not dishonestly, by the recruit. There is something to be said for special tests with a view to vocational selection for certain technical branches, with due regard to physique, previous experience and inclination. Clearly, general fitness for the job and capacity for any special training that may be required should tend to reduce the neurotic reaction to dissatis-

faction and lack of interest. The Cambridge psychologist Bartlett<sup>(3)</sup> put the position well when he wrote: "On the whole by intelligence tests a man may safely be ruled out, but by intelligence tests alone a man cannot safely be ruled in."

#### Training.

As a practical measure only the more obviously subnormal or "nervous" are likely to be rejected on application for enlistment. Physique and intelligence can be assessed satisfactorily, but morale and temperament must come before the test of experience. In civil life we assess these qualities largely on a man's record obtained from his own statements and from such other sources as are available. Whether a man be brave or timid, steadfast or vacillating, we can know only by the way in which he has behaved in certain circumstances. We form our impressions in the course of acquaintance with a man and measure him against standards which we form in the course of years of experience. No doubt the majority of us find it difficult to formulate this largely intuitive mental operation.

The change from civil to military life is for the majority of recruits the biggest upheaval that they have ever had to face. The uprooting from a quiet routine existence, separation from home, loss of personal freedom and subjection to unexpected restrictions and authority are some of the many novel stresses which may find a weak spot in the young soldier's morale. And the man who enlists to escape from an unpleasant situation, whether it be economic, occupational or domestic, often has reason to contemplate that it is better far to

... bear those ills we have  
Than fly to others that we know not of.

It is during the training period that the majority of "martial misfits" will come to light and should be dealt with. Some recruits with mild nervous instability will settle down and improve in general physique and mental efficiency. More will disclose their latent psychopathy as training proceeds. It is desirable that the same regimental medical officer should be with a unit during the whole or at least the greater part of the training period and accompany it overseas. The more often the regimental medical officer is present at field exercises and at the recreational activities of his unit, the more he will add to the knowledge of the men he has met on his sick parades an invaluable insight into the personalities of the majority of the rest of the unit. As the family practitioner of the regiment he should be approachable in regard to personal problems, fulfilling this responsibility, it is to be hoped, no less efficiently than the padre.

The detection of a psychopathic condition during training, before the troops proceed overseas, is considered so important that the Director-General of Medical Services asked a committee in New South Wales to make some recommendations. Accordingly, the following suggestions were submitted.

#### Recognition of Psychopathic Types and of Potential Cases of Neurosis amongst the Military Forces.

The following conditions, if persisting or becoming apparent in the course of training, call for medical examination and, if deemed advisable by the medical officer, reference to a medical board.

1. Failure to comprehend and carry out instructions and general awkwardness in drill.
2. Untidiness and lack of cleanliness in the person.
3. Lack of regard for discipline; deliberate antagonism to discipline, including persistent offenders, or indifference to it (carelessness rather than active antagonism).
4. Undue shyness, timidity and solitariness.
5. Peculiarities and oddities of behaviour and pronounced mannerisms.
6. Bed wetting.
7. Sex perversions, masturbation, homosexuality.
8. Alcoholism.
9. Irritability, tearfulness, depression.
10. Suspicion and querulousness.
11. Homesickness and worry over home affairs.

12. Boisterousness and excessive exuberance (often a "cover" for fear and lack of confidence); display of other emotions in excess.

Also:

13. The indefatigable scribe and diarist.
  14. Those who are constantly "picked on" by their fellows or ridiculed or taken advantage of.
  15. Those who attend sick parades frequently with trivial complaints.
  16. Those complaining of undue fatigability, breathlessness and precordial distress on slight exertion.
  17. Those displaying a persistent rapid pulse, often with tremors.
  18. Chronic "dyspeptics".
- In classes 15-18 physical disease must, of course, be excluded with reasonable confidence, while the possibility of malingering must be borne in mind. The majority of cases with "functional" symptoms will be found on further inquiry to provide other evidence of temperamental instability.
19. Cases with "fits". Whilst it is important to make an accurate diagnosis, the hysteric is as unsuited for military service as the epileptic.
  20. A man's statement that he has been treated before for psychoneurosis or psychosis by his own doctor, or in a general or special hospital should, if possible, be supported by a certificate. The severity of the nervous disorder may be gauged by its effect on his social and economic adaptations (e.g., amount of time lost from work).

A man who has had a definite "nervous breakdown" or who develops psychopathic symptoms such as those mentioned above, should not be sent overseas. If useful in any military capacity he may be retained on home service. For example, some defectives who are quite untrainable as soldiers prove diligent and useful kitchen helps and general camp "rouseabouts".

When a presumed psychopath is referred to a medical board for decision as to disposal, the regimental medical officer should indicate clearly in Part II of D2 not only the symptoms of nervous instability displayed by the patient, but also the ways in which he has shown himself to be unsuited for military life. Such information is indispensable to a medical board when a man displays few or no signs of nervous instability at the time of examination.

Although the medical officer in the course of his various duties with his unit will observe some cases, many more will be brought to his notice if the other officers in the unit know what to look for. The regimental medical officer should use these notes as a basis for lectures to the officers and senior N.C.O.'s of his unit on the subject of the prevention and ascertainment of nervous disabilities in soldiers.

#### On Active Service.

With regard to the preservation of morale amongst the troops, I propose to touch on a few aspects only which concern us from a medical standpoint. Moreover, upon us devolves the responsibility of formulating our attitude towards the whole problem of the disposal of men who become temporarily or permanently unfit for further service by reason of a nervous or mental disability. We have to bear in mind that the medical attitude will ultimately be reflected in the policy adopted by the administration. Most of us can recall the wide and indiscriminate application of the term "shell shock" to all sorts and conditions of psychoneurotic disability in the army during the greater part of the last war; this, in the words of the "Report of the Committee of Inquiry,"<sup>(1)</sup> was a "gross and costly misnomer" which "should be eliminated from our nomenclature. It is a catchword which reacts unfavourably on the patients and on others." It was estimated that genuine concussion as a result of exposure to shell explosions, but without any external wound, accounted for between 5% and 10% of all the cases in which the diagnosis of shell shock was made. To quote again from the report, 80% of the "shell shocks" were "emotional shock, either acute in men with a neuropathic predisposition or developing slowly as a result of prolonged strain and terrifying experience, the final breakdown being sometimes brought about by some relatively trivial cause". The committee recommended that psychoneurosis, even if shell explosion was deemed to be a factor, should not be classified as a battle casualty any more than ordinary sickness.

Among the conditions stressed by the committee as "tending to increase the incidence and severity of mental and nervous disorders in time of war" and, we may add, amongst all classes in time of peace in regard to their responsibilities, are the following:

All those factors by which a soldier or even a potential soldier is encouraged to believe that the weakening or loss of mental control provides an honourable avenue of escape from military service at whatever period of his service.

That the general comfort and well-being of the troops, control of infectious disease (especially venereal disease) and adequate recreation will promote efficiency, needs no emphasis here. The detection and treatment of psychoneurosis should be attempted as early as possible with even more enthusiasm and perseverance than in civilian practice. The regimental medical officer has the advantage which he did not enjoy as a civilian doctor of having his panel of patients not only under close observation but also under control. He should be on the lookout for such symptoms as fatigability, irritability and jumpiness, insomnia, loss of appetite, and such more obvious exhibitions of emotional instability as anxiety attacks, crises of weeping, unsociability, disinterestedness and depression. Alcohol and tobacco may be sought as a means of relief with the craving of an addict. Company commanders and others will no doubt send men exhibiting these features to the medical officer.

Amongst the many stresses that the soldier has to endure there is one which he may from time to time have to share with the civilian in these days of "total warfare", and that is the more or less passive endurance of attack by land and by air. It may in some instances be a good policy to send a man who is becoming unsettled out with a patrol or raiding party, to provide him with some other means of working off his pent-up nervous energy. Allied to what may be termed the syndrome of suppressed voluntary activity are the anxiety symptoms of anticipation states before battle, in which, as in the keyed-up states preceding an athletic contest, there occurs a vigorous mobilization of the biochemical mechanisms concerned in the preparation for fight or flight. Until voluntary action takes place the mental state is one of acute uneasiness. Further reference will be made to this aspect of psychopathology in the section dealing with civilians. Unfortunately, as the war continues there is to be anticipated an increasing amount of psychoneurosis as the capacity to withstand shock, and more particularly stress over a prolonged period, gradually wears out. The incidence of neurosis is said to be higher in technical branches exposed to great danger, such as machine-gun, engineering and tank units.

A reminder may not be out of place that psychoneurosis may be covered by a diagnosis of rheumatism, dyspepsia and debility. It may happen in military as in civilian hospitals that the general medical wards hold more psychological problems than even the psychiatric annexes. Another point which has engaged the authorities in Great Britain and here, is the prevention of boredom and nervous invalidism among men undergoing lengthy treatment for injuries to the limbs. In such cases the value of well-organized occupation and recreation, prescribed and regulated as part of treatment, is established beyond question. Some words of warning by the late Dr. A. W. Campbell<sup>(2)</sup> concerning the treatment of psychoneurotics, especially during the process of evacuation, are well worth repetition:

To save resistive cases from acquiring the invalid habit, the shorter their stay in hospital the better. It cannot be too plainly indicated that strongest measures should be formulated for dealing with them on transports, on disembarkation and prior to discharge. This is a continuous critical period, during which they must be guarded with the utmost tact and circumspection against themselves and their friends and a grateful country.

#### The Civilian.

The civilian in total war may be exposed to danger equally with the soldier; but, being unable to retaliate directly, has to endure and to find a substitute response for the natural impulse to revenge. In so far as the



civilian lacks adequate organization and training, his morale is apt to suffer. The deeply rooted and even instinctive loyalties of the average man are to his family, the social sense being far less keen in regard to the contacts of the workshop and other groups. In a time of emergency the civilian may be called upon to protect lives and property with whatever group he may find himself. As Rickman<sup>(7)</sup> has pointed out, the morale of each individual is strengthened by being a member of a group and by having a task and a responsibility for the safety and welfare of others. The dangers which threaten the morale of the individual who is not satisfactorily engaged in some form of national service, were emphasized by Trotter,<sup>(8)</sup> and his words apply with an even greater force today:

It must surely be clear that in a nation engaged in an urgent struggle for existence the presence of a large class who are as sensitive as any to the call of the herd, and yet cannot respond in any active way, contains very grave possibilities. The only response to that relentless calling that can give peace is in service; if that be denied, restlessness, uneasiness and anxiety must necessarily follow. To such a mental state are very easily added impatience, discontent, exaggerated fears, pessimism and irritability.

The guiding principle for the preservation of morale in an emergency should be: "Everyone to a job and a job for everyone."

Here the members of National Emergency Services can assist bodies with recognized authority, such as the police and fire brigade, in educating the general (non-corporate) public beforehand and exercising control and direction during an emergency.

In so far as the disposal of civilian psychoneurotic casualties may have some effect on the morale of the general population and its proneness to emotional crises, it may be noted that Mira,<sup>(9)</sup> basing his views on his experiences in Barcelona, has stated that "when a man did not return to his post after a nervous breakdown his comrades were quick to notice it and there was a tendency for more neuroses to appear", and "it was our experience that you can always fill your psychiatric beds no matter how many you decide to have; the supply creates the demand". In the "Memorandum on Neuroses in War Time"<sup>(10)</sup> it is advised that while intensive treatment should be applied to psychoneurotic casualties, such patients should be sent to their homes afterwards whenever possible.

If patients in whom such a step is not absolutely necessary are transferred to hospital the conditions from which they are suffering may be accentuated or prolonged and the extent of neurotic disorder in the population may be greatly increased.

#### The Factory Worker.

Whilst the factory worker shares the general risks of present-day warfare with the rest of the civilian population, he is also exposed to psychological dangers connected with the special conditions of his occupation. The output of unusual effort over a prolonged period under the stimulus of enthusiasm and higher wages is likely to precipitate a breakdown in impulsive, emotional and "nervous" individuals. The exhausting effect of longer hours of work may be intensified by insufficient or unwise recreation. General education on these points and supervision and advice by trained welfare officers might have preventive results of real economic and social value. In the factory worker such symptoms as increasing fatigability, defective concentration, waning interest, irritability and discontent, to say nothing of loss of physical condition and a host of somatic symptoms lacking any clear physical basis, indicate that the breaking point has been reached. So far psychoneurosis amongst the civilian population in the United Kingdom is reported to be negligible. The medical officer of health of Coventry referred to calm defiance after the air raids and a decrease in the numbers attending the psychiatric out-patient departments, although some people seemed to be temporarily stunned after their terrifying experiences. On the other hand, a lay social investigator<sup>(11)</sup> found numerous persons in quieter districts who had left the great centres after being subjected to bombing and who exhibited intense depression and retreat. Many had taken to their beds and remained there for weeks.

#### The Child.

If the emphasis which has been laid in recent years on the enduring effects of impressions received in our early years is in any way justified, it follows that children need special consideration in our schemes for the prevention of psychoneurosis. Fortunately, impressionability and plasticity are the natural qualities of the young nervous system. The memory of unpleasant experiences, however severe, provided that they are of fairly brief duration, tends to be crowded out by more pleasurable later impressions. Long-continued uneasiness and tension are far more noxious to emotional stability than intense single shocks. Accordingly the view has been expressed in England that distressing experiences of air raids have left comparatively little aftermath of emotional upset in children, whereas evacuation involving a disruption of home life and separation from the parents and brothers and sisters has a far more disturbing effect. The abrupt breaking up of habits is tolerated badly at either end of the age scale. The need for security and a settled mode of life is greatest in childhood, although coveted by all ages. The most common psychoneurotic symptoms which have been noted in "evacuated" children are enuresis, somnambulism, depression and anxiety, especially anxiety for members of the family left behind in the danger zones. Interference with home discipline and with schooling may well cause a rising tide of delinquency. Long hours in crowded and ill-equipped shelters with a minimum of privacy have exposed children and adolescents to physically unhygienic conditions and to moral risks, the consequences of which have yet to be appreciated. For a smaller number of city children whose upbringing lacked system, if it did not qualify them for the title of neglected, removal to the care of the right sort of foster parents in safer areas has been of the greatest benefit, both physical and mental. Such are a few of the problems of childhood in wartime which we may unhappily have to face, but in regard to which a definite policy will be difficult to attain.

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- (4) H. Bartlett: "Psychology and the Soldier", 1927.
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#### PSYCHIATRIC PRACTICE AND CLINICAL MEDICINE.<sup>1</sup>

By N. V. YOUNGMAN,  
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In any specialty new methods and new ideas on the causation, diagnosis and treatment of disease are being continually evolved. There is often a tendency to associate these advances with the specialty in which they were first noted. When such views are brought forward at such meetings as this, the discussion not infrequently remains confined to a limited sphere. For instance, if hematemesis is being considered, the discussion centres round that problem rather than round the search for allied conditions which might provoke a comparable disturbance of physiological processes.

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on July 4, 1941.



There is another side to this question—the necessity to evaluate the worth of advances in any specialty to the wider realm of clinical medicine. It is important to see not only whether these specialized advances can be applied to other branches, but also whether they can help in establishing the general principles underlying clinical practice. In these days, too frequently masses of scientific detail are reported without an endeavour to seek their meaning. It is only when these factors are borne in mind that the pitfalls following the development of knowledge along a specialized path can be avoided.

So tonight I wish to discuss modern psychiatric practice, not so much for its own problems, but rather for those aspects which have a common interest with other spheres of clinical medicine. Perhaps I should have used the words "present day" rather than "modern", because the latter word readily conveys to our minds something new. Actually it is not everything new that I wish to discuss, since owing to the sudden development of many new contributions we are inclined to forget well founded truths and procedures. I propose to outline the workings of a modern psychiatric unit, to examine its various departments and their application to general medicine, and, finally, to discuss psychological factors in the causation of disease. My remarks are mainly concerned with teaching hospitals, because it is here that are best reflected the results of medical education and practice.

What is meant by the sphere of psychiatric practice? The majority would answer that it implies mainly mental hospitals. They would say that patients sent to these places were usually in a hopeless condition, although now with the introduction of malarial and shock treatments there is a ray of hope for them. In addition, they would say, psychiatry is also served by a small section attached to general hospitals. This section is usually tucked away in some small corner. To it are sent patients whose ailments have not responded to the usual lines of treatment, frequently surgical. As well, the maladjusted individuals of our social system are sent here for temporary refuge. The psychiatrist also has access to some in-patient beds, usually part of a general medical ward. Any patient of his, on admission to hospital, is immediately hustled through the ward to one of the appointed beds. He is almost regarded as a leper, and is constantly watched for suspicious acts which allow his transfer to the observation ward and thence to a mental hospital.

I believe that this is not an unfair conception of the position of psychiatry in this country. This view has arisen, firstly, because its complicated terminology appears to make the understanding of this subject difficult, and, secondly, because the word "psychiatry" is usually used as synonymous with mental institutions. Yet, if we accept psychiatry as that branch of medicine dealing with the disorders of the mind, our clinical experience shows us that this conception of psychiatry is ridiculous. Disorders can be of any magnitude, and surely most clinical practice is based on mild disorders of the mind manifesting themselves with somatic symptoms!

Let me give you a few figures. Halliday stated that 30% of the insured sick in England have "neuroses". Cassidy stated that 30% of the patients with cardiac disorders seen in private practice are "neuropsychic". A leading London surgeon at a recent discussion said that 80% of his patients were neurotic. At the same time he stated that it was impossible for the number of present-day psychiatrists to deal with them. So we may say that at least 30% of medical practice is concerned purely with mild psychological disorders. Probably in another 30% of cases psychological factors outweigh the associated physical disease. In addition, there is a very small percentage of cases in which the early stages of the more serious mental disorders manifest themselves. It is this last group which we usually associate with the practice of psychiatry. I believe that all these cases enter into the province of psychiatry, or if we would use a more suitable term, psychological medicine. Naturally this province is great, and calls for many specialized branches in its own particular realm. Mental institutions at first appear to be a large branch, especially when one considers that there

are almost the same number of beds devoted to the care of the mentally ill as there are devoted to ordinary medical practice. Yet the numbers of the mentally ill are relatively static, so they are not so significant a portion as at first appears.

I am more concerned with the remainder—those with apparently mild disorders, those with associated physical disease, and those in the early stages of the more serious disorders. From the figures I have given you they form the major part of medical practice, and yet when we consider their management we find that no real attempt is made to cater for them. However, I shall return to this later. From this brief analysis we see that the field of psychiatry in clinical medicine is great, and psychological methods should find a large place in its everyday practice. In the past, too often the efficiency of a bedside manner has largely determined success in coping with this factor in disease.

Let us now turn to a more modern scene. Here, too, we will find mental institutions in the main similar to our own. But it is when we turn to the general hospitals that we find a different state of affairs. I should like to discuss the psychiatric set-up of a hospital of, say, 1,000 beds. There would be a psychiatric block, perhaps of 100 beds. There would be a full-time medical personnel of ten, a director, two or three seniors, and the rest men who have served as resident medical officers before seeking further experience in this branch of medicine. There would be 20 psychiatrists doing part-time work in the out-patient clinics; this is usually two half-days a week. There would be a full-time psychiatrist attached to the general medical wards. Part of his duty would be to demonstrate to the students psychological mechanisms in such disorders as cardiac failure, ulcer, toxic conditions *et cetera*. There would be a full-time psychiatrist attached to the children's hospital. A full-time psychiatrist would be attached to the main out-patient department, his duty being to confer with physicians and surgeons on any patients when they first visited the hospital. If they appeared to present purely psychological problems they would immediately be transferred to the psychiatric unit. This method would eradicate our system of referring patients to the psychiatric section after failure has attended their treatment in other sections. If any of these patients continue to be unsuccessfully treated by surgeons over a considerable period, they are refused by the psychiatrists and left to haunt the surgical unit as grim reminders of psychological factors in disease. Fortunately—or is it unfortunately?—these people receive little encouragement in this atmosphere, and slowly drift away to seek solace in other clinics or at the hands of faith-healers. The psychiatric staff would meet daily; usually a case would be presented in great detail and everyone would offer comment on it. Finally, the senior members would sum up the discussion and at the same time indicate any relevant literature on that particular problem. At other meetings recent literature or research work would be reviewed. The work of the junior members would also be supervised in the wards and in the out-patient department.

I now wish to discuss the basic teaching in such a unit. It is the old story of the soil and the seed. Perhaps we could be a little more scientific by describing the soil as the patient's personality, and the seed as the manifestations and causation of the presenting illness. A careful and detailed study would be made of the family background, of the patient's early development, his school record, his reactions to life's stresses and illnesses, and his personality before his present illness commenced. So the soil would be studied. Then all the features of the patient's mental and physical state at the time of his illness would be noted, and, if possible, exciting factors, whether psychological or physical, would be determined.

It is thus seen that the illness is not viewed as a disease entity, but rather as the behaviour of an individual with a certain diathesis reacting to certain stresses to produce a certain type of reaction which necessitated his seeking attention. Observe that to give an adequate diagnosis it is as important to study the soil or personality as the type of reaction, be this mania, depression or

anxiety. I believe it is the emphasis given to this necessary truth that places modern psychological teaching ahead of teaching in other branches of medicine.

I am not being unduly critical in saying that present-day medical teaching devotes itself largely to the diagnosis of symptom complexes. If these are not readily evident from the clinical aspect, then the accessory aids of the laboratory are quickly invoked. The attempt to examine the soil, if it is made, is only half-hearted. Any attempt to discuss this factor is airily dismissed with such words as "tissue resistance". There is a tendency to stress the seed rather than the study of the soil and the clinical features of the disease process. For instance, how often are careful notes kept of the make-up of the patient or of the development of the manifestations of, say, a pneumococcal infection? More often one seeks to substantiate the clinical diagnosis of "pneumonia" by X-ray examination and sputum analysis rather than by noting individual variations from patient to patient.

It is only by more accurate recording of observations of disease processes and constitutional factors that clinical medicine can contribute its share to medical science. Such methods appear time-consuming; but the time is really consumed in learning the methodical way of eliciting these facts. Psychiatry is thus endeavouring to find factors of the various psychological diatheses, as well as studying the immediate features of mental disorder. This approach is as old as medicine itself, but is being obscured in other spheres of medicine by undue emphasis placed on non-clinical methods.

Let me instance several examples of its application.

Several weeks ago a lean, gaunt, painted woman was brought along to a psychiatric clinic. She had dressed herself in wet rags. She had starved herself. She had slept in draughts. She had taken all these measures in order to end her days by catching pneumonia. Yet she had failed dismally in her task. Many of us who take all known precautions against such infections succumb almost to the whisper of pneumonia. Had I sent this woman to the medical unit, asking why she had not caught pneumonia, I should probably have been regarded as a fit companion to accompany her to a mental institution. Surely she would have served a more useful purpose as an object for the investigation of this problem of the individual susceptibility to disease, rather than having her wishes thwarted in some mental hospital.

Then there is the woman confined to her house with alleged heart disease. She said the doctor told her that she had it. Perhaps he did. She had no heart disease. She had a wastrel husband. Her alleged heart disease was a convenient psychological escape from facing her friends. That she reacted in this way might have been deduced from her personality type.

Again, I should like to stress the careful evaluation of any illness which the patient says he has experienced. How often are we satisfied with the mere eliciting of the fact that the patient has had appendicitis? Closer questioning reveals that at this time he had a vague pain, generally in the right side of the abdomen, present intermittently for some weeks, and for this his appendix was removed. If we were a little more exacting in our questioning we would find that a period of mental stress preceded this illness. If this man should later present himself with vague indigestion or headache, we should be chary of making a physical diagnosis when we had already learned of his reaction to mental stress by somatic symptoms.

I cite this not only to show the value of an examination of the past history in ordinary medical practice, but to indicate that it now assumes importance in military examinations. Here one of the most difficult problems is to cull out those who are mentally unfit for overseas service. It is by a careful consideration of past illnesses rather than by their mere tabulation that one may gain hints pointing to the psychological misfits. As a further guide, in psychiatric practice the school record is demanded in order to assess quickly the intellectual powers of the patient. I am sure that if this were more frequently asked for from recruits, it would uncover men who would need further interrogation before being classed as fit for military service.

This basic conception of mental disease is also important when we wish to consider the value of any treatment. We

see that illness lies between two extremes. In some diseases the fault is with the soil, in others with the seed. There are the patients with poor personalities, whose lives are a continual stream of mental upsets. At the other extreme, there is the apparently well-adjusted person unfortunately afflicted with an acute illness. In between are all variations. It is only when we bear this principle in mind that we can properly evaluate new methods of treatment. It is the lack of discrimination between the seed and the soil that accounts, in part, for the conflicting results from similar treatment in different centres.

At this point I must discuss the shock forms of the therapy. Much could be said of their modes of action, their indications, their complications and features rising out of their application. From our study of disease we see that the treatment is aimed at two factors: firstly, the precipitating illness and, secondly, the patient's personality. Any alteration in the latter by shock treatment can hardly be expected on theoretical lines; but it is the acute episodes for which this type of treatment should be of use. And so we find that it is the acute illnesses in which these methods prove most helpful. Originally they were employed for the acute schizophrenic reaction, but now they are equally or more frequently used for other like reactions, such as depression and confusion. In a general way one may say that the more acute reactions are served best by "Cardiazol", and the acute and subacute reactions by insulin. However, my aim is to stress the value of these methods in clinical medicine and not to discuss their relative importance.

Firstly, "Cardiazol" or electrical shock treatment makes available a demonstration of the actual epileptic seizure. It is not infrequent for patients to complain of "turns" and "fits"; yet close questioning will not give us their true nature. If we lack the knowledge of the features of the epileptic seizure, we may treat such disorders as epilepsy, though they are hysterical in nature. In different cases I sometimes attempt to use "Cardiazol" shock as a diagnostic procedure. In the case of the genuine epileptics "Cardiazol" does not usually produce an aura similar to that occurring in the spontaneous seizure, but the post-convulsive stages of the true and the induced seizure are comparable.

To the neurologist shock therapy gives a method of investigating the convulsive disorders. The type of convulsive reaction depends not only on the dose of the drug used, but also on the rate of its introduction into the circulation. By this method we can show all grades of epilepsy, from a simple twitching of a limb through all phases to a major convulsion. Again, this method allows us to evaluate the anti-convulsant power of many drugs. I have been using this method in guinea-pigs to note the effect of certain sedative drugs. It is interesting to report that morphine and hyoscine increase and distort the action of "Cardiazol", whereas the barbiturates, the bromides and chloral hydrate inhibit its action in varying degrees, depending on the type and amount of the preparation used.

To the orthopaedist the introduction of "Cardiazol" has stimulated interest in the mechanism and significance of spinal fractures. The literature shows that this complication may occur in up to 40% of cases. Most often the fracture site is the mid-thoracic region. The fractures are usually symptomless. Other patients have severe pain, which frequently is muscular in origin. How are the fractures produced? We are taught that there is practically no movement between the thoracic vertebrae, and this seems evident from anatomical dissections. Consideration of the mechanics of the muscular stresses in this region also offers no reasonable evidence for their occurrence. Despite immobilization of the spine with measures short of spinal anaesthesia, these fractures still occur. So we must await a more rational explanation on their origin. A more practical question is how significant is this X-ray evidence of fracture. In a recent article it was reported that in 14.7% of cases spinal fractures occurred with "Cardiazol" treatment; 10.4% of fractures were seen in cases of idiopathic epilepsy; although in these the fractures were mostly in the lumbar region, and in a control



series of apparently ordinary patients no less than 1.5% showed X-ray evidence of fractured spine. Indeed, when we consider the universal giving of "Cardiazol", the incidence of these fractures must be enormous. But, as yet, little has been reported on the late results of these disabilities. Perhaps it is another instance of the adaptability of the individual, and if the person is not made aware of this fracture he carries on without ill effect. We should contrast this result with compensation cases, in which the person is aware of his X-ray examinations. In these cases years of disability result from slight fractures.

The effect of "Cardiazol" on the heart has also been investigated. The commonest disorders noted were irregularity of rhythm. This is not infrequent. It follows soon after the convulsion and usually persists for short periods. Any part of the conducting mechanism may be affected, so that a wide range of irregularity results. The electrocardiographic and clinical experiences are that these large doses of "Cardiazol" have little permanent action on the heart. Such findings show how disorders of cardiac rhythm may be of central origin—a fact we tend to forget, seeking the cause of cardiac disorder in the heart itself.

Turning to insulin therapy, I have had no personal experience with this treatment, although I witnessed its use in many centres. As I stated earlier, I believe its advantage over "Cardiazol" is in conditions in which the illness is a little more ingrained into the personality—conditions in which delusions or fixed ideas are more prominent. Should time prove that its use is of little worth to psychiatry, it will still have done a great service in deciding many of the problems associated with carbohydrate metabolism. It has demonstrated the extreme variations to its action in the apparent normal. Some people can be given doses of five units and become comatose, whereas others may require up to 600 units. Only a few years ago the pancreas was thought to be the master gland concerned with carbohydrate metabolism; now we know there are many other factors, including bowel absorption, liver function, muscle storage and pituitary hormones which equally share in this task. This is a beautiful illustration of the reaction of the organism as a whole to an upset in a particular function. Again, insulin therapy has allowed a careful study of the protean features seen in the hypoglycæmic state. It has shown how this condition can be readily controlled by very small doses of glucose, and, if need be, this can be given intramuscularly. There is one other advantage of insulin treatment over "Cardiazol", and that is, as the patient awakens from his coma one can interpret his behaviour as passing through the Freudian stages of development. During this period intense psychotherapy can be given.

A study of narcotherapy permits a brief discussion of the place of rest in the treatment of disease. By rest we mean rest of the mind, rest of the body, as well as the effect of one on the other. Mental rest may be procured in two ways: firstly by diverting activities of the pre-occupied mind into other channels. We shall find that this is one of the functions of occupational therapy. Secondly, rest is secured by the dampening down of the mental processes. In mild cases this is served by the exhibition of sedative drugs through the day and a hypnotic at night. In more severe cases this is insufficient, and by narcotherapy an endeavour is made to keep the patient asleep, often for several weeks. Various drugs have been used for this purpose, but it is wise to become conversant with several of them and restrict one's use to these. I use "Somnifaine" as the basic drug, and reinforce its action with paraldehyde. This form of treatment demands an efficient nursing staff; it is important for the nurse to give adequate nourishment as well as to avert the risks of infection. If this is lacking, one is inclined to disparage this form of treatment. Mental rest may also be secured by physical means. In many centres hydrotherapy is used extensively for this purpose, especially for restless patients.

In other realms of medicine the need for rest has perhaps been over-stressed. It probably arose from the emphasis laid on the value of rest in allaying pain. But this view was originally introduced for the relief of pain associated

with inflammation, and then it implied only local rest. So too frequently we see the whole body rested when rest for only a part is necessary. At the same time, the harmful effect of this practice on the mind is not adequately realized. In head injuries six weeks' complete rest are said to be essential to avoid sequelæ. Yet this practice is dangerous for two reasons: it allows the mind to centre on such things as compensation and the like, and it also allows the body to lose its adaptability. This factor is important in the case of elderly people, because sequelæ such as headache and giddiness probably result from loss of tone in their vascular systems. Reeducation is easy for young people, but the innate stubbornness of the older person makes his readjustment hard. From my study of the physical basis of healing in trauma, it is difficult to see how such people would be adversely affected by limited activity and occupational therapy. Contrast this with the virtues of the plaster technique in the treatment of fractures; it allows the patient quickly to resume his usual activities.

This over-emphasis on rest, often unconsciously laid, provides one of the difficult problems associated with repatriation. Too often one finds chronic illnesses resulting from prolonged periods of rest, often in luxurious surroundings, the patient being attended by enthusiastic voluntary workers, who little realize the harm they are doing. These factors render very difficult the readaptation of these men to their previous existence. So in any illness one has to decide whether rest or activity is essential to the healing processes. If rest is desirable, it is necessary to be certain that such a procedure will not bring in its wake harmful reactions of the mind or interferences with the normal functioning of the body.

Reference must now be made to another essential department of a modern psychiatric unit. Its object is occupational therapy. This method was introduced into psychiatry over one hundred years ago, when mental patients, freed of their shackles, were permitted the liberty of motion. Its value was obscured till recent years, when its scientific use as an aid to treatment was demonstrated. As its name implies, its function is twofold—for occupation and for therapy. We have seen that one of its functions in treatment is to provide mental rest by creating fresh interests. Sometimes it is used gradually to build up for the patient a new vocation, at others to develop hobbies, at others again to reawaken social contacts. The type of occupation will depend on the requirements of the patient as well as on the facilities at hand. In some cases it may mean only simple movements, as with housework; in others more exacting tasks are utilized, such as modelling, carpentry and workshop crafts. Outdoor work, such as gardening and the building of recreational facilities, is available in larger institutions. It is probable that games such as tennis, croquet, badminton *et cetera*, are amongst the most valuable forms of occupational therapy. They have the merit of emotional uplift, community drive and physical exercise. A game section in a general hospital would be a valuable sifter of the important categories "work-shy" and "work-incapable".

Only now is occupational therapy finding a more generalized use in other spheres of medicine. It is particularly useful in hospitals catering for patients with chronic ailments, such as tuberculosis. There is a great need for it in our ordinary hospitals. How often do patients with traumatic lesions lie in bed meditating on compensation and other similar matters when they could be usefully employed in some form of occupation? Again, how frequently would such a centre be a boon to out-patients, especially those receiving pensions? They could again become useful members of the community instead of spending their days huddled in tenement houses, leading a life of soul-destroying pauperism.

I would especially plead for the hundreds of epileptics whose continued pensioning and idleness are a slur on a civilized community. A further extension of the psychiatric scheme envisages the formation of centres and colonies where a person has the work of which he is capable, rather than trying to fulfil the dictates of an industrial



ruling which fails to recognize this individual variation in ability.

Several other branches of the scheme are worthy of brief mention. Firstly, there is the role of the social service worker. Her functions are many. They include the investigation of home conditions, arrangement of holidays to suitable places, the search for help from charitable organizations, the putting into practice of medical instructions. All these factors are an important aid in the proper management of all ailments.

Undoubtedly too little thought is given to the designing and furnishing of hospitals to provide a "healing atmosphere". That it is true of many of our hospitals only the unobservant could deny. Particularly is this the case in the psychiatric section. Here the furnishings should be more akin to a home than to a hospital. Libraries, reading rooms and an amusement centre should be a *sine qua non*.

Finally, there is the research section. It should not be a unit apart; it should be closely associated with the clinical unit. Here any member of the staff should be able to test or try any hypothesis he wished. It need not concern his own subject. It is only by a close examination of clinical and experimental phenomena that we fulfil our functions in eliciting the natural history of disease processes.

I have examined the workings of various sections of a psychiatric unit, and have endeavoured to stress those aspects most significant to our purpose. We have seen how the work of the medical staff would be integrated by daily conferences between social workers, occupational therapists, nurses and medical staff. By this means the component sections would function more harmoniously. Yet there is something else which determines the success of any such unit. It is this: the spirit of the place and the team—that something which permeates the atmosphere of the whole unit, that something which, though definite, is neither definable nor tangible. Mainly it is determined by the enthusiasm of the controlling figures. The conferences help in its dissemination. It marks the difference between the almost nihilistic atmosphere of the old asylums and the "get better" atmosphere of progressive institutions. It is this which determines the success of a unit, be it elaborate or simple, rather than the bricks and mortar which house it. Any architect can make a large hospital; but only an enthusiastic and sufficiently numerous medical staff can transform it into a great hospital.

I do not wish to imply that the treatment of all psychiatric disorders should be undertaken by such a unit. Their very prevalence provides the main reason for an efficient general practitioner service. Rather have I discussed it to show the proper perspective of psychiatry and the need for its close association with other fields of medicine, as well as to consider the auxiliary forms of treatment to the psychological methods.

Let me now pass to a consideration of the place of psychological factors in the causation of disease. From time to time various theories are put forward to explain the origin of the more indefinite medical ailments. Indefiniteness arises only because we are unaware of their exact pathology. In the early days the cause was too much bad blood; more recently it has been septic foci. Now we frequently see articles wherein such conditions as ulcer, asthma, thyrotoxicosis are explained merely as the result of psychological conflict. The type of these diseases which ensues depends on the type of personality and the type of conflict.

Let me quote from a recent article:

It is concluded that effort syndrome is predominantly a disorder occurring in individuals of an unduly high and severe self regard and the importance of repressed aggression in most of these patients is emphasised. Emotional strain is found to be by far the commonest precipitating factor.

Our great difficulty in accepting such statements is the difficulty of deciding cause and effect. The necessity for a rheumatic patient to stay in hospital for the removal of tonsils may give a temporary respite from domestic problems. Should he follow this period with a holiday, during which he makes new contacts, his aches and pains will more readily clear up. It is these factors rather than

the removal of the septic focus which may determine the relief of his condition. Again, how difficult it is to assess whether the sensitivity to different allergens is equally part of our make-up as is our height, weight *et cetera*!

These problems would be easier if we could measure them. Galileo pointed the way to science when he said that we must measure, for this is the final stage of accurate observation. And it is only when we can measure that we can also have a method of communicating our observations correctly to one another. We have been slow to grasp this fact in medicine. We do measure some things, such as blood pressure, although the wisdom of this procedure may be doubted because of the significance placed on it by the lay public. Haematology has made remarkable strides since the size of cells, haemoglobin content *et cetera* were accurately measured, and the solution of problems in this particular sphere becomes an absorbing study. So when we can measure, we can be certain of the factors entering into disease processes. We must at times envy the oculists, who are able to utilize measurements extensively in their practice. In the bacterial causation of disease another form of measurement, the necessity for fulfilling Koch's postulates, guides us to the significance of any of these organisms.

When we wish to evaluate these psychological factors we find ourselves wanting an adequate method of measuring emotion. If I tell you that a patient is moderately depressed, you can form no accurate picture of the patient's state unless you are fully conversant with the meaning of my terminology. In psychiatry we have tests for measuring intelligence, and to a large degree they serve their purpose. But it is in the measuring of personality and emotion that we need most help. Certain bodily responses, such as pulse rate and blood pressure, have been used; but we find extremes occurring in comparable psychological conditions. Another method recently brought forward by Professor Mira uses as its basis the recording of voluntary movements. Here the patient is given a pencil and asked to draw lines and figures in certain directions. The nature of the drawing is then analysed, and to some extent it may be measured. For instance, depressed patients draw lines that are short and few. Another instrument recently introduced is the electroencephalogram. In this we have a method of recording brain electrical potentials similar to those recorded in the heart by the electrocardiograph. When we consider the interrelation of brain and mind, these tracings prove of great worth in giving us an accurate method of recording abnormal functions. It has demonstrated abnormal rhythms in conditions such as epilepsy and also in potential epilepsy. So we see that efforts are being made to measure psychological states. But if we again remember the fact that mental illness depends as much on the soil as on the seed, we shall not be unmindful of the difficulties of formulating any such tests.

So if we are to accept psychological factors as a basis of disease, we must be prepared to use circumstantial evidence. The figures given earlier bear witness to this universal fact known by observers in all branches of medicine. Then our own personal observations from day to day show how readily the various bodily activities are influenced by emotion, and it is not unreasonable to suggest that more prolonged psychological troubles will cause chronic upsets of bodily function. Lastly, there is again the response of these ailments to psychological treatment. Symptoms result merely from upset of function, and we have seen that in a considerable number of cases this upset is due to psychogenic factors. Yet we must be careful to avoid the conclusion that the same upset of function is always due to the one cause, often the one with which we are most familiar. We have difficulty in deciding not only causative psychological factors, but also their prominence in the treatment of disease. The curse of our educational system is that we are taught to accept facts without knowing the why or the wherefore. This is continued in our adult life. Each day the radio and the newspapers blast us with slogans such as "Aspirins will cure headaches". Admittedly, aspirin has an analgesic effect; but what proportion of its curative effect is due

to this fact rather than that to the suggestive advertising? Actually, many aspirin cures are mere variants of the psychological process of distraction. The headache of an angry child is served equally well by chocolates as by aspirin. A similar explanation accounts for the frequency of abnormal sensations, ranging from discomfort to pain, associated with the menstrual cycle. It is, so mother says, the time for being unwell; and so she sows the seed for the production of symptoms which may create a lifetime of misery.

I have stressed the prominence of mental disorders in sickness and shown how they can be dealt with by a modern unit. Yet, turning to our own medical centres, we find that practically no attention is given to the teaching of the treatment of these so-called mild disorders. In London it is estimated that among the first out-patient attendances in hospitals, 100,000 of the subjects are neurotic. Comparable figures would give us at least 10,000 in this city. I presume most of these find their way to the medical clinics. Yet if we investigated the medical out-patient centre, we should discover that there was no organized instruction in such neuroses. If we visit the medical wards we shall see the physician almost invariably demonstrating some physical condition. Perhaps he is asking the students to detect a murmur in a heart racing at 140 beats to the minute. I often wonder whether it is a physical possibility for all of us to be able to distinguish sounds at these rates. Whilst these examinations are being conducted the patient's features frequently betray the anxiety associated with his condition. When the illness is discussed at the bedside, he readily listens for any words which may have a bearing on his state. Yet usually the discussion bears on the cardiac lesion, and the mental factors, which are so obvious, are ignored. It is the treatment of these mental factors that can give real aid to the patient rather than any treatment aimed at the physical lesion.

Physicians are also constantly being received from the surgeons for an earlier recognition of gastric cancer. Their figures show that only one in ten of these lesions is operable, and to these distressing figures we must add the operative mortality figures. A considerable number of men of this age group have gastric symptoms arising from the stress of modern living. Unless this is recognized, these potential cancer patients become neurotics. I am definitely of the opinion that it is better to save ten neurotics and miss one cancer patient than to diagnose one cancer and make ten neurotics. This group also stresses the need for adequate explanation of the psychological basis of symptoms after the patients have been told that investigations have had negative results, for symptoms of organic or psychological origin are equally real to the patient. It is a deplorable admission that students receive no practical teaching on the disorders we are considering. They are taught that the illness can be diagnosed as "psychogenic" only in the absence of any physical factor rather than in the presence of the usually characteristic features of a mental disorder. It is truly paradoxical, since in physical ailments stress is rightly laid first of all on the exclusion of the commonest causes; yet the neurosis in these takes pride of place.

At present much is being said and written on post-war reconstruction and particularly on the socialization of medicine. This is inevitable; but how much thought is given in this scheme of things to the survey of the actual medical needs of the community? Surely this want should determine the type of medical service proposed. Any service will fail if the glamour of the scalpel is still allowed to attract most medical graduates. We have seen how prevalent psychiatric disorders are and how facilities for their treatment are lacking. We have seen how we create morbid reactions by not adequately recognizing emotions, such as fear, in the production of disease, and also because the doctor cannot afford to be wrong. From necessity he tempers opinion with discretion by prolonging the "bottle of medicine" idea long after its point of therapeutic necessity is past. This problem will be dealt with adequately only when the primary factors of eugenics, correct education, adequate work, recreation and feeding

are ultimately attacked by some far-seeing government, interested in public health measures. Our system is wanting if we fail to apply such knowledge to the lessening of morbidity. So, too, war and peace have as their basis psychological and sociological factors.

In the meantime we have to deal with the problems in the best way possible. It should be as important for psychology to be one of the basic sciences as are anatomy, physiology and pathology. It should be the duty of clinicians to demonstrate more often the mental aspect of their cases. If this were done, our graduates would be well versed in the management of the various forms of ill-health. There would then be less outcry for more psychologists or for allowing the practice of this type of work by laymen, or for the institution of unorthodox clinics. It would lessen the spell of the various faith healers and the appeal of patent medicines, for these depend for survival on their playing on the mental factors of the disease. At the same time it should be our duty to voice more loudly the harmful effect of medical advertisements and to place before the proper authorities the requirements of the community for the proper practice of the art of medicine.

#### CAUSATION OF FRACTURES OF THE NECK OF THE FEMUR.

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THE mechanism of causation of fractures of the neck of the femur has never been satisfactorily explained. Fractures resulting from a fall have a definite traumatic factor explaining their occurrence; but in the case of those occurring as the result of a trip or false step, the traumatic factor is not so obvious. In the following pages we offer an explanation on a mechanical basis of the manner of causation of these fractures.

A consideration of the mechanics of the hip joint showed so many variable factors that it was considered better to present the subject matter in two sections. The first section deals with the surgical aspect and a simple application of the mechanical principles involved; while the second section deals with the mechanical principles, their application, the theoretical calculations involved and the experiments undertaken.

#### SECTION I.

(By E. Sandner.)

Fracture of the neck of the femur has, especially during the past few years, proved to be a subject of great interest. Numerous articles have appeared, and since the introduction of the three-flanged nail and osteotomy the results of treatment have been considerably improved. However, practically the whole of the literature has been devoted to the problem of treatment. The question of causation holds but a small place in the voluminous literature concerning this fracture.

For a considerable time I have felt that the solution to this problem is to be found in a study of the mechanics of the hip joint together with the "spring" or "shock-absorbing mechanism" of the leg, and during the past three years I have tried to collect clinical evidence referring to the argument to be put forward. Although the evidence collected supports the view held, the number of available subjects with uncomplicated senility who have a waddling or shuffling gait has been small. However, it

now seems impossible to carry the investigation further. Therefore, following a survey of the literature available, methods of causation of this fracture based on mechanical principles are presented.

The term fracture of the neck of the femur is here taken to refer to those fractures in which the whole of the fracture line lies between the medial and lateral anatomical boundaries of the femoral neck. This fracture is common in old age and occurs more frequently in the female than in the male.

#### Varieties of Fracture of the Femoral Neck.

Fracture of the neck of the femur may be divided into three varieties.

##### Birth Injuries.

In birth injuries the cause is obviously traumatic, and this variety will not be considered further.

##### Pathological Fracture.

The term "pathological fracture" is here taken to imply a fracture occurring in the presence of an obviously pathological condition, either general or local. It may be the result of osteomyelitis, or may follow irradiation (Kropp,<sup>(1)</sup> Baensch<sup>(2)</sup>), Charcot's disease (A. Thomas<sup>(3)</sup>), *tubercle dorsalis* (Bougie,<sup>(4)</sup> Delay,<sup>(5)</sup> Guichard<sup>(6)</sup>), von Recklinghausen's disease (A. P. Ashton<sup>(7)</sup>) or metastatic tumours (O. Timpe<sup>(8)</sup>). In these cases an obviously pathological condition is present, and the problem of the causation of the fracture presents little difficulty.

##### Other Fractures.

The third variety is that occurring in an apparently normal bone. Sometimes the cause is obvious, as in the case of fracture of the femoral neck quoted by Harild,<sup>(9)</sup> which occurred during an attempt to reduce a dislocated hip joint, or in the case of gunshot injuries. It is interesting to note that patients suffering from a fracture of the neck of the femur due to a gunshot injury frequently die before they reach hospital (P. Turner,<sup>(10)</sup> A. Bowly<sup>(11)</sup> and J. R. Buchbinder<sup>(12)</sup>). The remainder form the group ordinarily met with in civil practice. This group suffers from fractures which glory in a variety of names—for example, intracapsular fracture, medial fracture of the neck of the femur, or subcapital or transverse fracture—and represents the group to be discussed.

#### The Relevant Anatomy of the Neck of the Femur.

The neck of the femur is really a prolongation upwards and medially of the shaft of the femur. The anatomical boundaries are described by Cunningham.<sup>(13)</sup> On the upper medial end is the head of the femur, which forms the medial boundary. Laterally its junction with the shaft is marked by the intertrochanteric line in front and the intertrochanteric crest behind. On the lower and anterior portion of the neck there is a strong ridge of bone which strengthens the curve, the *calcar femorale*.

The angle between the neck and the shaft varies, being more open in young people and decreasing with age, and more open in males and in long bones (Fraser<sup>(14)</sup>). In the adult the angle is about 120°. The normal variation is regarded by Fraser<sup>(14)</sup> as being from 110° to 140°, while Mercer<sup>(15)</sup> puts the normal variation as being from 120° to 140°.

The bony trabeculae forming the internal structure of the bone form a definite pattern and some of these bundles of trabeculae have received proper names; for example, the arch of Adam is the term applied to those trabeculae running upwards and medially from the lower border of the neck to the head of the femur.

The female pelvis shows some differences from the male pelvis. The male pelvis is higher and its walls are more splayed out, while the female pelvis has a wider sacrum, greater distance between the posterior superior iliac spines and proportionately greater width between the acetabular hollows.<sup>(16)</sup>

#### Changes Occurring in Old Age.

In old age the bones become more fragile. Fairbank<sup>(17)</sup> states that the whole skeleton is to some extent affected, and that the condition is commoner in females than in males. This he attributes to the fact that most females give up active exercise earlier than males.

Forgue<sup>(18)</sup> states that in old people the tissue of the neck and trochanter becomes rarefied and fatty (*osteoporosis senile*, or *osteomalacia* of Ribbert and von Recklinghausen). The trabeculae forming the arch of Adam disappear and large cavities form in the neck of the femur with smaller cavities in the trochanter, until this portion of the bone is converted into a mere shell which is very easily broken. These changes Forgue attributes to circulatory troubles, anaemia or venous stasis with resorption of calcium. He further states that not only does senile atrophy occur, but the distribution of the bony trabeculae is altered.

#### Causes of Medial Fracture of the Neck of the Femur.

Wakeley and Hunter<sup>(19)</sup> state that medial fracture of the neck of the femur is explained by the atrophic changes which take place in the *cervix femoris* of elderly people, and that it often requires but little violence to produce this fracture, the causative accident being merely a slight stumble or fall, such as slipping off the kerb or tripping upstairs; the bone yields and the patient falls.

Forgue<sup>(18)</sup> sets out the following causes: (i) the result of a force applied from behind forwards on to the trochanter; (ii) vertical falls on to the feet or knees, resulting from a false step off a kerb; (iii) in old people, muscular contraction causing forced outward rotation of the femur.

Odelberg-Johnson<sup>(20)</sup> confines his attention to the first method of causation mentioned by Forgue (*vide supra*). The following quotation from his article briefly summarizes the aspect considered by him:

A fall on the lateral or postero-lateral portion of the trochanter major produces a compression in the axis of the neck of the femur. In all these fractures a compression element exists and all show more or less bone destruction with shortening of neck. The outward rotation of the femur, which is the main clinical sign, has different causes. The main reason is that the posterior part of the neck is more compressed and destroyed than the anterior.

According to Riedinger and Bigelow, this results from the weaker construction of the posterior part of the neck.

According to Kocher the most lateral part of the trochanter major is dorsal to the central axis of the neck. A blow on the lateral or postero-lateral part of the trochanter major results in the force acting obliquely on the central axis of the neck from behind.

As the head is fixed by the anterior lip of the acetabulum, such a force must tend to bend the neck with the concavity behind. A fracture produced in this way is really a combination of a bend and a compression fracture in which the convex anterior contour bends and breaks, and the concave posterior contour is mainly compressed.

If the compression element is sufficiently great, the distal fragment may rotate further until its anterior portion comes to be anterior to the anterior border of the proximal fragment. The posterior cortex of the distal fragment can in this way become impacted into the spongiosa of the proximal fragment.

Odelberg-Johnson then proceeds to give a most minutely detailed description of the X-ray appearances of the bone in a number of cases and the macroscopic anatomy of some post-mortem specimens. In some cases death occurred some time after the accident, and the specimens showed a considerable degree of bony absorption. From these data he then attempts to verify the method of production in accordance with the argument previously advanced.

The above is a survey of the literature available. One article<sup>(21)</sup> of which I am aware proved to be unavailable in Australia and is therefore not included in the survey.

#### Methods of Fracture of the Femoral Neck.

A force causing fracture of the femoral neck may act in at least one of three primary directions. It may act in a latero-medial, antero-posterior or vertical direction.



Since the femur is fixed in relation to a vertical force, a fracture of the femoral neck could result from a force acting downwards on the head of a fixed femur. Similarly, a force acting in the latero-medial or antero-posterior direction must act on the *trochanter major*, the head of the bone being fixed in a relatively deep acetabular cavity. Let us now consider the possible results of a force acting in each of these three directions.

#### Consideration of a Force Acting Latero-Medially.

A force acting latero-medially could be produced by a blow or a fall on the *trochanter major*. If the violence is assumed to be the result of a fall, the fracturing force applied to the trochanter would act approximately along a line at right angles to the axis of the shaft of the femur. Owing to the obliquity of the femoral neck, the result of this force would depend on the relation of the resultant compression and shearing elements. The compression element would tend to produce a compression fracture of the neck, or if the femoral neck were strong, a central dislocation of the head of the bone.

The shearing element acting in a direction at right angles to the central axis of the neck would tend to cause a fracture of the femoral neck. Figure I refers to an hypothetical case in which the neck shaft angle is  $135^\circ$ . The line *GACF* represents the axis of the femoral shaft, and the line *AB* the axis of the neck. Let us assume that the violence results in a force represented by the line *CD*, from the point of contact *C*. We require to know the relative magnitude of the compression force acting along the line *CE* parallel to the axis of the neck *AB*, and the shearing force acting at right angles to *CE*. This will be represented by the line *DE* drawn from *D* perpendicular to *CE*. Since the angle *GAB* is  $135^\circ$ , and *AB* is parallel to *CE*, the angle *BAF* is equal to the angle *ECF*, which is  $45^\circ$ . Therefore the angle *DCE* and the angle *CDE* both equal  $45^\circ$ . The triangle *CDE* is therefore an isosceles triangle and *CE* equals *DE*. The shearing force therefore equals the compression force.

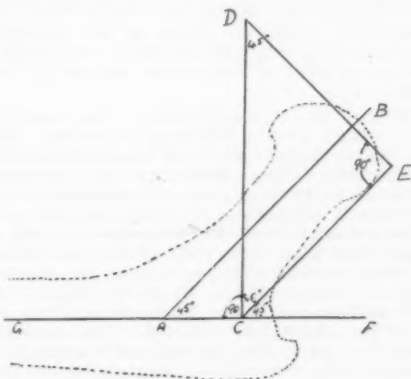


FIGURE I.

Obviously when the neck-shaft angle is greater than  $135^\circ$  the shearing force will be greater than the compression force, and *vice versa*. Any centrifugal force acting on the body as a result of its swing through the arc of a circle in its lateral fall has, for the sake of simplicity, been excluded from the consideration; but it would tend to increase the shearing element. Its magnitude, however, would be slight.

When the shearing and compression forces are equal, a fracture may result which one would expect to be impacted. However, it would surely be rare in practice to find a force acting purely in a latero-medial direction, and if such a set of circumstances did occur, the violence would probably result in a comminuted fracture in the pertrochanteric region.

#### Consideration of a Force Acting in an Antero-Posterior Direction.

The head of the femur is fixed in the relatively deep acetabular cavity; but it is free to turn. Since the mass of the neck is small and free from muscular insertions, its inertia must also be small, and a force acting in an antero-posterior direction applied to the *trochanter major* would surely result in rotation of the leg rather than in fracture of the femoral neck. If, however, this force was aided by an element acting in a latero-medial direction, the head of the femur would be relatively more fixed and fracture of the femoral neck could result. This aspect has been discussed by Odelberg-Johnson (*vide supra*). The result of such a force on the bone would depend on its point of application, its direction, its magnitude and the degree of atrophy of the femoral neck; but it seems to me that it would theoretically be of little significance whether the force acted from before backwards or from behind forwards. A force applied to the posterior part of the trochanter acting obliquely from behind forwards would tend to cause a bending of the femoral neck with the concavity anteriorly. I cannot agree with Kocher's views as expressed by Odelberg-Johnson.

The following case is an example of fracture resulting from a force acting in a plane at right angles to the shaft of the femur.

Mr. J.N., aged fifty-two years, while walking along the road was knocked down by a motor car which approached from behind. The bumper bar struck the lower part of the right leg, causing a compound fracture of the lower portion of the tibia and fibula, thus excluding any possibility of a vertical force. He was then thrown forwards and sustained a transverse fracture of the femoral neck of the same limb in addition. The compound fracture was put in a plaster cast and a King nail was introduced into the neck of the femur. For reduction, traction was obtained from a Kirschner wire through the tibial tuberosity and internal rotation from "Elastoplast" placed round the thigh and fixed to an overhead beam.

#### Consideration of a Force Acting Vertically.

Fracture of the femoral neck by a vertical force could result only from a force acting from above downwards on to the head of a fixed femur. Since the femur is fixed only when the leg is on the ground, this must be the direction of the force causing the fracture which results from a false step.

Forgue states that fracture can result from a vertical force caused by a fall on to the feet or knees as the result of a false step off a kerb. He states that this force is normally resisted by bony trabeculae forming the arch of Adam, and as these trabeculae become atrophied in old age, fracture results; but he does not state how a false step can produce a vertical force of sufficient magnitude to result in fracture, while a normal step does not. A study of the normal shock-absorbing mechanism shows that when this mechanism breaks down, as it sometimes does in old age, a false step may result in the production of a vertical force equal to many times the total body weight.

#### Mechanics of the Hip Joint and Shock-Absorbing Mechanism.

Consider what happens when a person hops down from a height on to one leg. The whole of the moving body weight (mass) is brought to a stop when the foot strikes the ground. The force required to stop the body weight must act through the head of the femur; but fracture of the neck of the femur does not occur, apparently because the force acting is not sufficient to produce such a fracture.

With regard to mechanical principle Number 2 (see section on mechanical principles), one finds that the force acting depends on the rate of deceleration. When the foot strikes the ground, the plantar-flexed foot becomes dorsiflexed and the knee and hip are both flexed. In other words, nature has provided a "spring" or "shock-absorbing" mechanism to reduce the rate of deceleration so that the femur can withstand the strain. A more detailed study of this shock-absorbing mechanism enables one to see how it

breaks down in old age, leaving a predisposition to fracture of the neck of the femur.

The foot consists of a number of small bones joined together in the form of an arch concave on its plantar aspect. This arch is maintained by ligaments and fascia (which for the purpose of the present discussion can be considered as inelastic), the muscles of the sole of the foot (except the abductors and adductors of the toes and lumbricales), and the tendons of three powerful muscles situated in the calf of the leg. When weight is applied to the convexity of the arch it tends to flatten. This flattening is resisted by the muscular supports of the arch; but this resistance is overcome, and flattening occurs until the strong ligaments and fascial bands on the plantar aspect are rendered taut, with fixation of the shape of the arch (Lake<sup>(22)</sup>). The decrease in the height of the arch represents the distance moved by the body after the foot strikes the ground, if all other joints are assumed to be fixed. As this distance is small, the rate of deceleration is rapid and the consequent shock-absorbing action is small. This is easily demonstrated in the following test: hop from a low stool to the floor with the knee fully extended. If you land on the flat of the foot the body receives a distinct jar. Now repeat the performance landing on the plantar flexed foot, and the jar is completely absorbed by the spring of the foot. By plantar flexing of the foot the deceleration is spread over a greater distance and the rate of deceleration is decreased. Deceleration commences when the anterior part of the foot strikes the ground and continues until the heel meets the ground, preventing further dorsiflexion of the foot.

If, then, the main part of the spring mechanism of the foot depends on the ankle joint, why is the foot arched? Consider the position if the bony structure of the foot consisted of a straight bar of solid bone. This bone would be subject to enormous strains, and acting as a lever of the first order with the fulcrum at the ankle joint, it would be very liable to fracture. Also, as the *tendo Achillis* acts on the short arm of the lever, enormous strain would be suddenly thrown on the *musculus triceps suræ* and frequent tearing of the muscle would result. By the breaking of the bony structure of the foot into small parts, bound together in the form of an arch by powerful ligaments, and by the supporting of the arch with powerful muscles, these difficulties are overcome. Then, when a powerful upward thrust is applied to the plantar-flexed foot, the relatively small component of this force acting in the direction of the muscles and tendons of the sole of the foot is first resisted by them. This throws a gradual strain on the *tendo Achillis* and allows *musculus triceps suræ* time to contract gradually before taking the full strain when flattening of the arch of the foot has proceeded as far as the ligaments will allow. The descending body weight is then resisted by the powerful plantar flexors of the ankle joint. This, I think, is the reason why the muscles of the sole of the foot are so powerful, although the movements of the toes are so limited.

Now try hopping down off a higher stool. The ankle joint cannot absorb all the shock unaided and genuflexion occurs; this involves flexion at the hip in order to maintain the erect posture. As the height from which one jumps increases, the degree of genuflexion increases, until when it reaches full flexion the heel strikes the buttock, transmitting the unabsorbed force direct to the pelvis and thus sparing the femur. When the foot-ankle and knee-hip shock-absorbing mechanisms have been excluded, yet another mechanism remains.

If you try hopping off a low stool on to a flat foot with the knee fully extended, there is a jar; but this jar is reduced by the hip, which moves from the abducted to the adducted position. The body weight is not brought to a sudden stop; the bony skeleton of the leg is stopped suddenly, but the opposite side of the pelvis swings down, thus reducing the rate of deceleration of the remainder of the body weight.

When adduction of the leg occurs before the foot strikes the ground (and this condition is difficult to produce experimentally), not only is the jar much greater, but one can actually feel a jarring of the hip joint.

#### *Changes Occurring in the Shock-Absorbing Mechanism in Old Age.*

In the normal walking of the healthy adult, the body weight is transferred from the toe of the posterior foot to the heel of the anterior foot, both knees being kept more or less flexed all the time (Elmslie<sup>(23)</sup>). This necessarily involves, first, the ability to stand on one leg with the knee flexed, and, secondly, the ability to stand on one leg and rise up on to the toes.

"An old man shuffles; an old woman waddles." This statement implies a difference between the manners of walking of the two sexes, and is apparently accurate. I have never seen an old man with a waddling gait. Of four with a shuffling gait, none were able to stand on one leg and rise up on to the toe; but all were able to stand on one leg, flex the knee and extend it again. These people, being bereft of the spring of the ankle joint—apparently through muscular weakness—derived their spring from excessive genuflexion. In order to maintain the body balance the hips are flexed and the trunk thrown forwards, the centre of gravity of the body being brought over the anterior part of the foot. Of a number of females aged over sixty-five years who were examined, three had a waddling gait. None of these could stand on one leg and rise up on to the toe, and none could stand on one leg, flex the knee and extend it again. In two cases it was apparently the result of overweight with a proportionate lack of muscular power; and in one case, when the subject was asked why she could not bend the knee, the reply was: "My feet hurt too much." Examination revealed corns on the ball of the foot and a mild *pes cavus*. Others examined had a milder degree of waddling gait. These subjects all had considerable difficulty in standing on one leg and practising genuflexion, until for those who had a fully developed waddling gait genuflexion was impossible. Apparently, as age increases, the elderly female, bereft of the shock-absorbing mechanism of the foot-ankle and knee-hip, uses an abduction-adduction movement at the hip as a shock absorber, and the consequent tilting of the pelvis results in a waddling gait.

#### *Application to Fracture of the Neck of the Femur.*

The loss of or deficient action of the foot-ankle and knee-hip shock-absorbing mechanisms in the elderly female may produce vertical strains on the neck of the femur in one of two ways.

**First Method of Action.**—Consider what happens when an elderly female with a waddling gait trips. When the posterior foot is moved forward it becomes caught in some object. The body weight continues to move forward while the victim attempts to extricate the foot by elevating it. Once the foot is released, it is moved forward to prevent a fall. By constant practice the knee is extended (if it is flexed the quadriceps will be unable to withstand the strain), and to enable this to be done, the pelvis on the same side is elevated and the thigh is adducted. Thus it comes about that the victim lands on the foot with the knee extended and thigh adducted. No shock-absorbing mechanism can work. The moving body weight is brought to a sudden stop, the rate of deceleration is high, and therefore a force of great magnitude is suddenly applied to the head of the femur.

While this train of events possibly occurs in some instances, it is probably rare, and I consider that the following method more commonly operates.

**Second Method of Action.**—After having investigated a number of elderly people, I have gained the impression that while a male tends to use the knee and hip joints as shock-absorbing mechanism by flexion of these joints, a female tends in a large proportion of cases to use the hip joint by means of abduction and adduction. For the sake of simplicity, let us assume that we are dealing with the case of a person who is using the hip joint alone as a shock-absorbing mechanism; she makes a false step and stumbles, but is able to attempt to regain her balance. The falling body weight (less the weight of one leg) acts downwards from the centre of gravity *C.G.* (Figure II) along the line *C.G., ED*. If the pelvis is horizontal and

the body vertical, this line will pass down laterally to the centre of the pelvis; for the sake of argument, let us assume that it passes vertically through the centre of the pelvis. Let us assume that this force equals 100 pounds. It will tend to cause tilting of the pelvis with adduction at the hip joint. Such adduction is resisted by the powerful abductors of the hip joint passing from the region of the *trochanter major* to the region of the ala of the ilium—diagrammatically, along the line *AB*. Actually, the apparatus is a bent lever of the first order, and not all the abductor muscles pass from the *trochanter major* to the ala of the ilium. It is impossible to assess accurately what part each muscle plays, as this will vary with the position of the limb and with the individual, so that an accurate assessment of the resultant force of these muscles is also impossible; but the downward components of these forces can be considered as acting on a straight lever of the first order. This is represented in Figure II as the line *EF*. Since the arm of the lever *EF* is longer than the arm *FC* (approximately 1.5 : 1.0; actual measurements on a pelvis, 3.67 : 2.55), the abductor muscles must exert a downward pull at *C* equal to 1.5 times the body weight (less the weight of one leg).

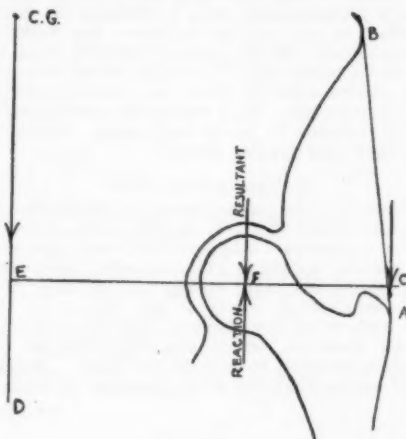


FIGURE II.

If it is assumed that this force is 100 pounds, then the force acting downward at *C* must be 150 pounds in order to maintain equilibrium. If, now, the rate of deceleration is such as to increase the force exerted by the body weight by 300%, then the force acting downwards along *C.G.*, *ED* becomes 300 pounds and the force acting downwards at *C* is 450 pounds. As both these forces act downwards, and as "to every action there is an equal and opposite reaction", the head of the femur must resist a downward thrust of 300 pounds + 450 pounds or 750 pounds. That is, the neck of the femur is suddenly called on to withstand a downward thrust equal to three times the normal downward thrust.

If the trunk is inclined to the opposite side at the moment of the accident, then the arm *EF* of the lever is longer, the ratio *EF* : *FC* becomes greater, and the total force acting on the head of the femur becomes greater.

#### Application of this Method of Fracture Production to Pauwel's Three Types.

Pauwel<sup>(2)</sup> classified intracapsular fracture of the neck of the femur into three varieties, according to the relation of the direction of the fracture to the horizontal. Group I comprises the impacted or "abduction" fracture, in which the direction of the fractured surfaces bears a relation of 0° to 30° to the horizontal. Group II comprises those cases in which the fracture line bears a relation of 30° to 50° to the horizontal. Group III includes those cases in which the fracture line is at an angle of 50° to 90° to the horizontal.

Let us now consider how these various types of fracture are produced. Let us assume that the neck-shaft angle is 135° (see Figure III). The angle *BDF* equals 135°; therefore the angle *BDG* equals 45°. Since the force downwards in the direction *ABC* is parallel to the axis of the femur *GDF*, the angle *CBD* equals the angle *BDG*—45°.

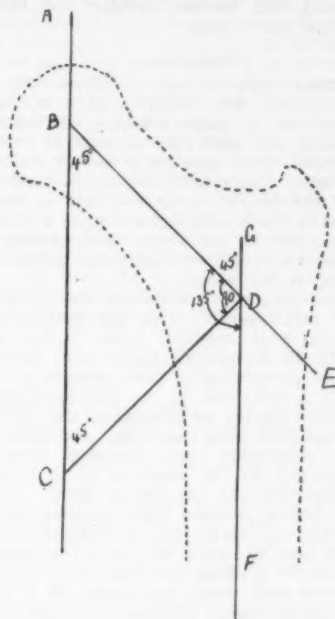


FIGURE III.

If *BC* represents the force acting on the head of the femur and a perpendicular is dropped from *C* on to the line *BDE*, we shall obtain the relative proportion of the compression force acting along the axis of the neck *BD* to the shearing force acting parallel to the line *CD* (shearing force). The angle *CBD* equals 45°. The angle *BDC* equals 90°. Therefore the angle *BCD* equals 45°. Therefore the triangle *BCD* is an isosceles triangle, and *BD* is equal to *CD*.

This means that in the case of a femur with a neck-shaft angle of 135°, when the downward force applied to the head of the femur acts along a line parallel to the axis of the shaft of the femur, the compression force equals the shearing force. It is then reasonable to expect an impacted (or "abduction") fracture to result (Pauwel's first type).

In a typical impacted abduction fracture, the upper part of the neck is more impacted than the lower part. Two factors help to cause this: first, the lower and anterior portion of the neck is strengthened by the *calcar femorale*, which resists impaction to a greater extent than the more spongy upper and posterior portion; and secondly, the pelvis is a bent lever, and the abductor muscles run obliquely from below upwards and medially. This must result in a turning moment acting on the pelvis tending to rotate it and the proximal fragment in an outward direction. Since the exact line of action of the abductor muscles will vary with the individual and with different positions of the leg in the same individual, the effect of this turning moment cannot be accurately assessed.

If the neck-shaft angle is greater than 135°, or if the downward thrust acts along a line lying at an angle to the axis of the shaft of the femur, the compression force will become greater than the shearing force.

When the neck-shaft angle becomes less than 135°, the shearing force becomes greater than the compression force, until in cases of *coxa vara* there is very little compression element and the strong shearing force causes an almost vertical fracture (Pauwel's third type).



In the above discussion it has been assumed that the direction of the forces is constant and the neck-shaft angle is a variant. If the neck-shaft angle is considered as constant and the direction of the forces as a variant, then, as the obliquity of the force from above downwards and laterally towards the affected femur increases, the compression element will become greater and the shearing element less, and *vice versa*.

#### Discussion.

This discussion explains how, as the result of a false step or of a stumble not resulting in a fall, a force of sufficient magnitude to cause fracture can be exerted on the femoral neck, and why such a train of events can be expected to occur more commonly in the elderly female than in the male. The elderly female is, therefore, liable to fracture of the femoral neck not only as the result of a force applied to the trochanter acting in a plane at right angles to the shaft of the femur and caused by a fall, but also as the result of a vertical force acting downwards on to the head of the bone.

After interrogation of a number of elderly females who suffered from this fracture, it is my opinion that in the majority of cases it resulted from a fall on to the trochanter. In all probability three other factors help to account for the prevalence of this fracture in the elderly female. First, I feel that as the result of asthenia and hyperpleisia with attacks of giddiness, the elderly female falls more frequently than the male. Secondly, deficiency of both the foot-ankle and knee-hip shock-absorbing mechanisms results in the adoption of an unsteady gait, further predisposing the subject to falls. Thirdly, the wider female pelvis, weaker arm muscles and unsteady gait would tend to make the trochanter the point of impact, rather than the shoulder, as in the case of a male.

Watson Jones<sup>(28)</sup> records the case of a man who fell from the crow's nest down the inside of a ship's mast. He sustained compression fractures of both calcanei and of the body of one lumbar vertebra. In this case the rate of deceleration must have been sufficiently rapid to exert a force of sufficient magnitude to produce these various fractures; but the femoral neck withstood the strain. This demonstrates the great strength of the femoral neck of the normal adult. It is therefore not surprising that it

is not until old age introduces some factor or factors capable of producing a weakening of the bone that fracture becomes at all frequent, and the greatest incidence falls on the proportionately smaller bones of the female with their greater liability to osteoporosis.

Adduction of the hip joint is a relatively poor shock-absorbing mechanism when the foot-ankle and knee-hip mechanisms become deficient. The whole of the body, but particularly the femoral neck, must therefore suffer repeated mild traumata, with congestion and decalcification as a result. The failure of the normal shock-absorbing mechanisms may well be a factor in the production of osteoporosis.

The problem why the female should use the hip adduction shock-absorbing mechanism is difficult to answer. The broader female pelvis with its steeper walls is probably more readily adaptable than the male pelvis. However, probably many other factors are concerned with the weakening of the foot-ankle and knee-hip mechanisms. Of three subjects examined in whom these latter mechanisms had completely broken down, two were over-weight and one suffered from painful feet. The continual use of high heels with the consequent injury to the anterior part of the foot (Lake<sup>(29)</sup>) may well be a factor, while over-weight and sedentary occupations help to weaken the quadriceps.

The collection of clinical evidence has been difficult and disappointing. Many subjects suffered from arthritic changes necessitating their exclusion, while some were too deaf and others suffered from too pronounced a senile dementia to cooperate. As a result, the statistics comprise too small a number to be of real value. Table I shows the tests used and typical results.

#### A Hypothetical Case.

From time to time cases occur in which the fracture occurs as the result of a trip or false step, the victim not falling. Let us consider a hypothetical case. Let us assume that a person weighing 125 pounds, possessing legs weighing 25 pounds each, makes a false step, falls off a kerb six inches high on to a flat foot with the knee extended, and, using the abductor muscles of the hip joint as a shock absorber, brings the remainder of the body weight (100 pounds) to rest in one inch. Reference to Section II shows that the force required to bring a mass

TABLE I.

Subject's Initials.	Sex.	Age. (Yrs.)	Gait.	Stand on One Foot and Raise Heel off the Ground.		Stand on One Foot, Flex and then Extend Knee.		Stand on One Leg with Knee Bent.		General Condition.	Remarks.
				Right.	Left.	Right.	Left.	Right.	Left.		
J.P.	M.	67	Careful; slight shuffle.	With difficulty.	With difficulty.	No difficulty.	No difficulty.	No difficulty.	No difficulty.	Slight wasting.	
A.G.	M.	78	Careful; slow.	Slight difficulty.	Slight difficulty.	Easily.	Easily.	Easily.	Easily.	Almost blind.	
K.G.	F.	65	Slow; slight wobble.	Only with great difficulty.	Only with great difficulty.	Fairly easily.	Fairly easily.			Obese; heavy woman.	
P.P.	F.	69	Slight wobble.	"I could if I practised."	"I could if I practised."	Capable of about 15° of flexion with difficulty.	Capable of about 15° of flexion with difficulty.				
W.	F.	73	Wobbling.	No. "Feet hurt too much."	No. "Feet hurt too much."	No.	No.	No.	No.	Fair.	About two months after this examination, this woman slipped down a step, fell and sustained an incomplete fracture of the neck of the femur.
M.	M.	70	Normal.	Easily.	Easily.	Easily.	Easily.	Easily.	Easily.	Patient said: "My legs are all right—my arms are the trouble."	
J.McD.	M.	74	Shuffling.	No. Only with great difficulty.	No. Only with great difficulty.	Comparatively easily.	Comparatively easily.	Yes.	Yes.	Fair; thin.	

of 100 pounds that has fallen six inches to rest in one inch is 600 pounds. The active body weight ( $P$ ) is now 600 pounds, and the total downward thrust on the head of the femur is  $2.44 P$  to  $2.96 P$ —that is, 1,444 to 1,656 pounds. Owing to the elasticity of the body, some reduction of this force must occur; however, it is difficult to see how this reduction can be sufficient to avoid fracture, especially when one considers the atrophied condition of the bone.

#### Acknowledgements.

My thanks are due to Dr. M. Curzon for assistance with the translations; to Dr. C. Stanley, medical superintendent of the Bendigo Base Hospital, for permission to examine patients at the out-patients' department; to the late Dr. Burke Gaffney for making the necessary arrangements and to the Board of Management of the Bendigo Benevolent Asylum for granting me permission to examine the inmates of that institution; and to Dr. J. E. P. Hogg for checking proofs.

#### SECTION II: MECHANICAL CONSIDERATIONS.

(By E. C. Thompson.)

##### For a Body Falling under the Influence of Gravity.

$$v^2 = u^2 + 2 \cdot a \cdot s$$

That is:

$$v = \sqrt{2 \times 32 \times s} \text{ ft./sec.} \dots (1)$$

Also

$$s = ut + \frac{1}{2} \cdot a \cdot t^2$$

That is:

$$t = \sqrt{\frac{2 \cdot s}{a}} \text{ sec.} \dots (2)$$

Where  $v$  = final velocity (feet per second).

$u$  = initial velocity,

= zero.

$a$  = acceleration (feet per second per second).

= 32 feet per second per second, for gravitational fall.

$s$  = distance fallen (feet).

$t$  = time taken (seconds).

The following table (Table II) gives the velocities attained and the time taken for the fall for falls of different degrees.

TABLE II.

Fall $s$ . (Inches.)	Velocity $v$ . (Feet per second.)	Time $t$ . (Second.)
6	5.65	0.18
12	8.0	0.25
18	9.8	0.30

##### For a Body Being Decelerated and Brought to Rest.

$$v^2 = u^2 - 2 \cdot a \cdot s$$

That is:

$$u^2 = 2 \cdot a \cdot s$$

or

$$a = \frac{u^2}{2 \cdot s} \text{ ft./sec./sec.} \dots (3)$$

Where  $v$  = final velocity = 0.

$u$  = initial velocity (feet per second).

$a$  = deceleration (feet per second per second).

$s$  = distance (feet) taken to come to rest.

Now the force required to cause a deceleration of  $a$  feet per second per second on a body of mass  $m$  pounds is given by the equation: Force = mass  $\times$  deceleration (in absolute units) or  $F = \frac{m \times a}{g}$  pounds weight, where  $g$  =

gravitational constant = 32 feet per second per second, and substituting the value of  $a$  from equation (3) above,

$$F = \frac{m \cdot u^2}{2 \cdot g \cdot s} \text{ pounds} \dots (4)$$

When this is applied to a human body falling and coming to rest on one leg, the mass which is then being decelerated is equal to the total weight less the weight of the fixed leg. An arbitrary value of 100 pounds has been taken, for simplicity, as it is then easy to fix the forces acting, in proportion to the "normal" value, when the body is at rest.

From measurements on a human body, it appears that the distance moved by the centre of the pelvis in coming to rest on one leg, only the abductor muscles of the hip joint being used, lies between two inches and one inch. When the normal action of ankle and knee is also present, the total decelerating distance will be greatly increased. For purposes of comparison, in Table III the forces which could be developed at the centre of gravity of the body, owing to deceleration by the abductor hip muscles, have been calculated for distances of six inches, two inches and one inch. (It is to be specially noted that the force is actually developed at the centre of gravity of the trunk and the free leg, which lies at a greater distance from the pivot or fulcrum than the centre of the body, and hence would give rise to even greater forces than those set out below; but this fact has been neglected for the sake of simplicity.)

TABLE III.

Fall. (Inches.)	Velocity at End of Fall. (Feet per second.)	Decelerating Distance. (Inches.)	Force Developed. (Pounds.)	Force Expressed as Percentage of Normal.
6	5.65	6	100	100
		2	300	300
		1	600	600
12	8.0	6	200	200
		2	600	600
		1	1,200	1,200
18	9.8	6	300	300
		2	900	900
		1	1,800	1,800

#### Time and Reflex Nerve Action.

Samson Wright<sup>(2)</sup> gives the velocity of impulse along human nerve fibre as 30 to 90 metres per second. If it is assumed that the maximum distance to be travelled by the impulse concerned is two metres (a generous allowance) and that the rate is 30 metres per second (the lowest value), then the time taken to prepare the muscles for the

deceleration is  $\frac{2}{30} = 0.066$  second.

This is much lower than the time taken for the six inch fall (0.18 second); hence any unpreparedness due to reflex action has been discounted.

#### Resultant Force Acting on the Head of the Femur.

The following discussion refers approximately to the case in Section I referred to under the subheading "Second Method of Action" (Figure II). In this it was assumed that the leverage is approximately 1.5:1.0, and that the forces acting are all vertical. There is a downward force of  $P$  pounds at  $E$ ; this must be balanced by a downward force in the muscles,  $Q_1 = 1.5 \times P$ , acting through  $C_1$ . These downward forces must be resisted by an upward force  $R_1$  acting at  $F$ ;  $R_1 = P + 1.5 \times P = 2.5 \times P$ .

According to the law of equal action and reaction, there must be a corresponding downward force equal to  $2.5 \times P$  acting on the head of the femur.

Hence, under normal conditions, the force at the head of the femur is 2.5 times the weight of the trunk *et cetera* plus one leg. When the body movement is rapidly decelerated, that force rises to 300% and upwards of the normal force—that is, to approximately 7.5 times the "body weight".

If the same reasoning is applied to a general case, it appears rather difficult to state definitely at which angle the muscle force acts; hence two other assumptions have been made: (i) that the muscle force ( $Q_s$ ) acts at an angle of approximately  $60^\circ$  to the horizontal; (ii) that the muscle force ( $Q_s$ ) acts at an angle of approximately  $45^\circ$  to the horizontal. The vertical components of the resultant force at the head of the femur have been worked out.

The method is the same for each case. If reference is made to Figure IV, then moment of force  $P$  about  $F$  is equal to  $P \times \text{distance } EF$ . This must be equal to and balanced by the moment of force  $Q$  about  $F$ , which equals  $Q \times \text{distance } FD$  (perpendicular to  $Q$ ). Hence,  $Q = P \times \frac{EF}{FD}$ .

Since the forces  $P$  and  $Q$ , and the reaction  $R$ , acting at  $F$ , must be in equilibrium, they must form a closed force triangle; and knowing the directions and magnitudes of  $P$  and  $Q$ , we can find the direction and magnitude of  $R$ , which is represented by the closing side of the force triangle; the vertical component of  $R$  is then found as shown in Figure IV. Figure IV is a diagram prepared from an X-ray photograph of an actual female pelvis. On it are superposed the assumed directions of the forces, the force triangles which were drawn to scale, and the vertical components of  $R$  determined as shown.

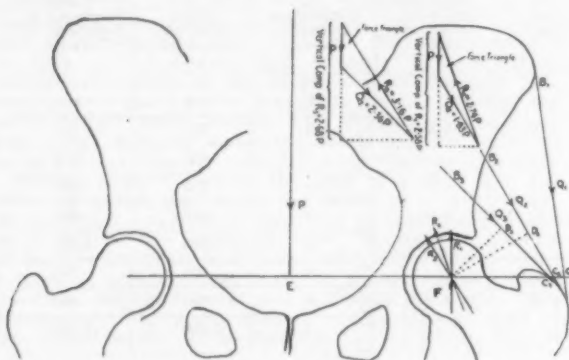


FIGURE IV.

This skiagram was in reality the second one taken. The first skiagram was taken at a distance of eighteen inches, through a diaphragm, with the patient in the recumbent position; the skiagram appeared to show a slight amount of distortion of the head of the femur. Hence a second photograph was taken of another female subject in the

erect position, at a distance of six feet, without a diaphragm. This, as was to be expected, was faint; but Figure IV was prepared from it without difficulty.

The values of the forces were calculated for both cases, and are tabulated below (Table IV); a comparison will show that the results are not greatly different.

#### Discussion.

From these results it appears that even when any angularity of muscular action is taken into account, the vertical force at the head of the femur is not much different from that assumed in Section I—that is, approximately 2.5 times the weight of the trunk plus one leg. In any case, the difference is an addition, tending to increase the force. The variation is from 2.5 to 2.9, approximately 15%, or  $\pm 7.5\%$  from the mean.

In order to check these results as far as possible, a model of the pelvis and the head of the femur was constructed. This is illustrated in Figure V. The shape of

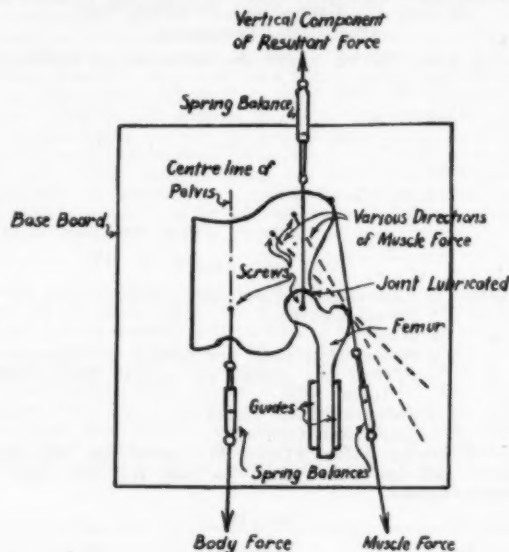


FIGURE V.

the pelvis *et cetera* was taken directly from the second of the X-ray photographs mentioned above, full size, and

TABLE IV.  
A. Case I: Skiagram I (subject horizontal, distance eighteen inches).

Direction of $Q$ .	Distance $EF$ . (Inches.)	Distance $FC$ . (Inches.)	Value of $Q$ .	Value of $R$ .	Vertical Component of $R$ .
Approximately vertical.	4.25	2.75	$\frac{4.25}{2.75} \times P = 1.55 P$	$2.55 P$	$2.55 P$
$60^\circ$	4.25	2.05	$\frac{4.25}{2.05} \times P = 2.07 P$	$3.0 P$	$2.82 P$
$45^\circ$	4.25	1.60	$\frac{4.25}{1.60} \times P = 2.66 P$	$3.56 P$	$2.96 P$

B. Case II: Skiagram II (subject erect, distance six feet, Figure IV).

Direction of $Q$ .	Distance $EF$ . (Inches.)	Distance $FC$ . (Inches.)	Value of $Q$ .	Value of $R$ .	Vertical Component of $R$ .
Approximately vertical.	3.67	2.55	$\frac{3.67}{2.55} \times P = 1.44 P$	$2.44 P$	$2.44 P$
$60^\circ$	3.67	2.0	$\frac{3.67}{2.0} \times P = 1.83 P$	$2.74 P$	$2.58 P$
$45^\circ$	3.67	1.56	$\frac{3.67}{1.56} \times P = 2.36 P$	$3.16 P$	$2.68 P$



was constructed out of five-ply timber; the ball and socket joint was made as circular and as smooth as possible, and the surfaces were lubricated with light grease. The backs of the pelvis and femur shapes were made very smooth, and mounted on a large piece of five-ply, also very smooth, so as to reduce friction as much as possible. The femur was placed in guides so that its motion was restricted to the vertical.

The forces were applied by means of spring balances attached by cords to screws placed at the required places on the model. A unit of eight pounds was applied vertically at *E*, and the forces at *F* and *B* were adjusted until the pelvis assumed the horizontal position. The force at *F* was kept vertical so as to measure the vertical component of the resultant, the horizontal component being taken by the guides of the femur.

The results in general agreed with the theoretical values to within 5% to 10%; this was considered sufficiently accurate to confirm the method of calculation.

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#### AMNIOPLASTIN IN ABDOMINAL SURGERY.

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THE problem of unwanted adhesions within the abdominal cavity has baffled surgeons up to the present time. The aim of this paper is to present a case which illustrates an apparently successful use of amnioplastin to prevent adhesions in an abdominal section. Although adhesions may form anywhere in the abdomen, apparently without adequate cause, it is recognized that injured surfaces are more likely to adhere, and reperitonealization has been the sheet-anchor of the modern surgeon. However, the suture materials used to hold the peritoneum in place themselves tend to cause irritation and therefore adhesions. It yet remains to be seen whether some such suture as plastigut, produced by J. J. Bellas,<sup>(1)</sup> which is said to be non-irritating, will solve this difficulty.

Other efforts have been made to evolve some kind of fluid which, introduced into the abdomen, will prevent adhesions by lubrication or by keeping the surfaces apart. Trials have been made of normal saline solution and of papain solution, introduced by B. P. Mullen,<sup>(2)</sup> 50 milligrammes of papain being used to one litre of Ringer's solution. These latter methods, if really successful in preventing adhesions, would involve a high degree of risk for should infection supervene, adhesions could not then form to shut off the infection and localize it, and generalized peritonitis would immediately occur. This danger would not exist with amnioplastin, the action of which is purely local.

After a perusal of the article by Chao, Humphreys and Penfield,<sup>(3)</sup> detailing the method of using amnioplastin (specially prepared human amniotic membrane) for the prevention of adhesions in brain surgery, their suggestion that it might be of use in the abdomen having been noted, it occurred to one of us (A.R.S.-O.), who had a case of recurring adhesions between the bladder and pelvic colon and sidewall of the pelvis, that the use of amnioplastin might be attended with success. It was suggested that even if adhesions were prevented at one spot they might form in numerous other places, and the patient would be no better off. Against this argument it seemed that if only the bladder could be protected the attempt would be abundantly worth while. Consequently the preparation of amnioplastin was proceeded with according to the method of L. J. Le Vann,<sup>(4)</sup> to eliminate the fat content, which was considered undesirable. At this stage we found that workers at the Walter and Eliza Hall Institute and at the Women's Hospital, Melbourne, were engaged in research on this membrane. From Dr. Kellaway we were able to obtain some membrane sterilized dry and freed from fat.

Our patient was a woman, who had undergone a number of abdominal operations, and finally pelvic adhesions necessitated operation in 1940. Her symptoms still persisted, however, and on April 25, 1941, operation was undertaken along the following lines.

It was found best to cut the amnioplastin into pieces about the size of a postage stamp, place them along the raw edges overlapping them like tiles, and iron out the irregularities with a dry swab on a stick. The adhesions that had to be separated were on the left side between a loop of pelvic colon and the anterior wall of the pelvis, and between the bladder and the pelvic wall. Peritoneum was carefully sutured over the raw surfaces with catgut. Then a piece of the delicate membrane was removed from its gauze envelope and an attempt was made to introduce it into the abdomen; it was used dry, as suggested by Dr. Kellaway. It was found that the forceps readily tore it, and on touching the edge of the wound it doubled up. In the end we had the membrane hopelessly tangled round the forceps. The pieces were five by four inches and three by three inches in size; we found this too large. Cut into smaller sections, they were placed along the sutured edges and covered also the catgut sutures. It was found that these pieces adhered not only to the parts, but also to any metal instrument, and any efforts

to smooth out bubbles or creases therefore pulled the membrane off again. This difficulty was finally overcome by the use of a dry swab of gauze on a stick, which smoothed out irregularities very neatly and did not adhere at all. The pieces of membrane overlapped and completely covered all injured surfaces, remaining in place by cohesion.

Now it is probable that the membrane would adhere best to the raw edges; but should the other side of the membrane become adherent to a portion of bowel, these two structures would be glued together by the thin piece of membrane. If this were to happen, we relied on the statement of Chao, Humphreys and Penfield that the membrane became completely absorbed in a month, in which case the two structures should separate again, as healing of any injured areas would then be complete. Probably a double layer of membrane would be better. Perfect asepsis, of course, is essential.

Dr. Kellaway states that experiments on animals have not been uniformly successful; but that may be due to the introduction of a foreign protein by the use of human amnioplastin. The use of human amnioplastin on the human being eliminates this possible source of trouble. Apropos of this, it seems that one cause of generalized adhesions may be the inadvertent introduction during operation of foreign protein in the form of dust or solutions.

The patient made a good recovery from the operation. There was slight trouble from a collection of serum in the subcutaneous fat, which was responsible for an irregularly elevated temperature of about 99° F. for some time and later caused the wound to break down superficially. Healing was, however, quite complete before the patient left hospital in three weeks' time. She is now walking about comfortably, and states that she has lost the dragging feeling she had on the left side before she entered hospital. The following is a brief account of the case.

E.O.D. was a married woman, aged thirty-two years. On September 3, 1934, when she was about four months pregnant, she had a miscarriage. On October 24, 1934, she gave a history of pain and uterine bleeding. Occasional slight dyspareunia was present. On vaginal examination the uterus was found to be retroverted. A modified Gilliam's operation (curettage and section) was performed.

On August 7, 1935, she gave a history of irregular uterine bleeding of six months' duration. Curettage was performed and the remains of an early pregnancy were found. Thereafter the patient gradually began to complain of more pain, of irregular menstruation and of dyspareunia. She had definite tenderness in the left fornix.

On March 19, 1936, total hysterectomy was performed, with removal of part of the left ovary, which was cystic. Thereafter pain and tenderness on the left side gradually became more troublesome, and about four months later vague bladder symptoms appeared, as well as frequency of micturition and pain. Dyspareunia continued and acute tenderness was present in the left fornix.

On October 22, 1940, abdominal section was performed, as a vaginal examination, a barium meal examination and cystoscopy suggested adhesions. A large mass of adhesions was found between the bladder, the pelvic colon and the left wall of the pelvis, the remains of the ovary lying within the mass. This mass was carefully removed and the raw surfaces were covered with peritoneum.

On April 25, 1941, as the previous symptoms and signs persisted, abdominal section was again performed; this time amnioplastin was used. A left paramedian incision was made, the *rectus abdominis* muscle being retracted outwards. There was troublesome oozing. When the peritoneum was opened adhesions were seen between a loop of pelvic colon and the posterior surface of the left *ramus superior* of the pubis. Then two bands of adhesions were noticed between the left edge of the superior surface of the bladder and the side wall of the pelvis. These were separated also. Great care was taken not to disturb the rest of the abdomen. The raw surfaces were then covered with peritoneum by catgut sutures, and the whole of the sutured edges were encased in amnioplastin, as has been described. The abdomen was closed in the usual manner, but no chromicized gut was used. Continuous catgut sutures were inserted in the fat. Recovery was uneventful except for a slight rise in temperature due to a collection of serum, which eventually caused the wound to break down superficially. The patient left hospital in three weeks, healing

being complete and her temperature normal. Her temperature has remained normal up to the present time. This is satisfactory, as she had had rises in temperature for weeks before her admission to hospital. Examination of the urine revealed no abnormality. She has been relieved of her bladder symptoms and the dragging pain of which she complained before the operation.

On May 26, 1941, vaginal examination revealed some tenderness of the area of the trigone of the bladder, but no tenderness in the right or left fornices.

#### Summary and Conclusions.

1. The question of abdominal adhesions has been discussed and a method of using amnioplastin for their prevention has been evolved.

2. An operation with the use of amnioplastin for this purpose has been performed for the first time in Australia, as far as we are aware, and is described.

3. We are satisfied that the preparation used was sterile and caused the patient no inconvenience. We should not hesitate to use it again.

4. The patient made a good recovery and was relieved of her bladder symptoms and the dragging pain of which she complained before the operation; her normal temperature was restored and vaginal examination revealed no tenderness in the left fornix.

5. While we realize that a large number of cases would be necessary to establish fully the value of the procedure, we hold that our results are sufficiently encouraging to warrant further trial.

#### Acknowledgements.

Our thanks are due to Dr. Charles Kellaway, of the Walter and Eliza Hall Institute of Research, Melbourne, for kindly forwarding us supplies of specially prepared amnioplastin; our thanks are also due to Dr. E. Neil McQueen for the efficiently induced and smooth anaesthesia, without which the operation could not have been carried out successfully.

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## Reviews.

### FRACTURES AND JOINT INJURIES.

LAST year we reviewed Watson-Jones's "Fractures and other Bone and Joint Injuries" in its first edition. Now, only one year afterwards, it arrives in its second edition.<sup>1</sup> We described the first edition as a credit to the author, to its school and to British surgery, as the best book on its subject that England has produced, and one of the best produced anywhere. The second edition maintains that standard, and has improved it. We had some criticisms to make in our review of the first edition. One of these referred to the absence of any reference to fat embolism. That omission has been made good in the second edition. We referred also to absence of any reference to hydatid disease of bone, but that omission still exists. Perhaps Dew's monograph is not available in the libraries of Liverpool; but let us hope that before the time a third edition is due, the author may have an opportunity of consulting it. Our criticism of the first edition mentioned that though the author advised traction by a pin through the tibia in Chapter 31, and deprecated traction by transfixion of the calcaneus, the illustrations showed traction by the calcaneus. This contradiction remains. We note as an improvement in the second edition, on page 517, the introduction of an illustration of an overhead frame, as used in fractures of the femur. No illustration of an overhead frame was admitted into the first edition. Our criticisms are directed towards improvement of a book that is already excellent, and that well deserves the popularity it has achieved and will continue to hold.

<sup>1</sup> "Fractures and other Bone and Joint Injuries", by R. Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S.; Second Edition: 1941. Edinburgh: E. and S. Livingstone. Super royal 8vo, pp. 735, with 1,050 photographs, skiagrams and diagrams. Price: 50s. net.

# The Medical Journal of Australia

SATURDAY, OCTOBER 4, 1941.

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## ORTHOPÆDIC MEDICINE AND SURGERY.

THE branch of medicine known as orthopædics was not widely recognized as a specialty in Great Britain and the Dominions until the war of 1914-1918 left such an enormous number of men so mutilated and crippled that reparative surgery became an obvious and urgent necessity and plans were made for its inception. That this was due to the vision and driving force of the late Robert Jones is well known. His was the national scheme of central orthopædic hospitals and after-care clinics that covered the face of England like a network and later on spread to Scotland and Northern Ireland. He it was who initiated special courses of training for surgeons, that they might be able to deal with the special problems, many and diverse, arising in the reparative treatment of the crippled soldier. He knew that this work called for special knowledge and also for the expenditure of a great deal of time in detailed attention to post-operative treatment and rehabilitation. In a letter on the subject of orthopædic treatment to Sir Alfred Keogh, then Director-General of Medical Services, he wrote in February, 1916, the following words: "The general surgeon, however brilliant, when confronted with these cases is unable to steer them in the right direction or to prognose their future." Frederick Watson, from whose "Life" of Robert Jones this quotation is made (page 165), states that it could not be anticipated that Jones's proposal for the establishment of a central orthopædic hospital, combining all the necessary departments and staffed by expert men under a director, would be accepted without a struggle. Opposition was made all the more likely because of Jones's preference for a staff composed of the younger generation of surgeons "with minds sufficiently flexible to grasp new ideas, and with sufficient energy to bear the strain that orthopædic surgery involves". However, the War Office was sympa-

thetic and Jones won his day. These were spectacular happenings and it is small wonder that Robert Jones is always mentioned, at least in British circles, as one of the founders of modern orthopædic surgery. If any one man had to be chosen from among British surgeons as the father of modern orthopædic surgery, the man named would be Hugh Owen Thomas, the uncle of Robert Jones, whose assistant Jones was and who was probably "more responsible than anyone else for establishing the basic principles of modern practice in many of its fields". Though we remember Hugh Owen Thomas and his nephew Robert Jones as having placed modern orthopædics on its present footing in British lands, we must not forget that in many other countries there were those who made important contributions to its art and adorned its practice.

It is important to remember that the chief characteristic of modern as compared with early orthopædics is the insistence on restoration of function as well as on anatomical repair. By keeping this in mind we shall never make the grievous error of regarding the orthopædics of today as being concerned only with the repair of deformity. If the importance of function is continually kept in view there will be little difficulty in going to the root of the matter. This was well expressed by Robert Jones when he wrote on the orthopædic outlook in military surgery in *The British Medical Journal* of January 12, 1918, that the orthopædic problem could be divided into two distinct parts—preventive orthopædics and corrective orthopædics. He held that the latter was more especially the department of trained orthopædic surgeons and that the preventive aspect required the help of every surgeon who had to treat wounded men at any stage, especially the early stage. Prevention in these circumstances is a branch of what has been described in these pages on a previous occasion as preventive surgery. If we think of orthopædics in civil practice, it is clear that the idea of prevention must be carried further still. This idea has been associated with orthopædics ever since the word was first used. Castiglioni in his recently published "History of Medicine" states that the term orthopædics was first used by Nicolas Andry in 1741 when he published a book entitled "*L'Orthopédie ou l'art de prévenir et de corriger dans les enfants les difformités du corps*". When in these modern times we take an unction to our souls and pride ourselves in our up-to-the-last-minute or new outlook on matters medical or surgical, we would do well to think of the man who defined orthopædics two hundred years ago.

The specialist in orthopædics has thus a wide range of activities. Like most others who devote special study to a branch of medicine, he must be concerned with both cure and prevention. On the curative side he aims at restoration of function and lessening of deformity. His treatment may, like that of general surgeons, involve operation, but if it does, he has to be more meticulous than the general surgeon in his after-treatment. Recovery of function may be slow and an orthopædic surgeon does not therefore allow his patient to wander from his care until he is satisfied that supervision is no longer necessary. It is the custom in Australian hospitals for orthopædic surgeons to attend the out-patient department as well as the wards, and this gives them a complete knowledge of their patients, which, it may be remarked in passing, should arouse the envy of general surgeons who more often

<sup>1</sup>"The Life of Sir Robert Jones", by F. Watson; 1934. London: Hodder and Stoughton. Royal 8vo, pp. 327, with plates. Price: 12s. 6d. net.



If the same reasoning is applied to a general case, it appears rather difficult to state definitely at which angle the muscle force acts; hence two other assumptions have been made: (i) that the muscle force ( $Q_1$ ) acts at an angle of approximately  $60^\circ$  to the horizontal; (ii) that the muscle force ( $Q_2$ ) acts at an angle of approximately  $45^\circ$  to the horizontal. The vertical components of the resultant force at the head of the femur have been worked out.

The method is the same for each case. If reference is made to Figure IV, then moment of force  $P$  about  $F$  is equal to  $P \times \text{distance } EF$ . This must be equal to and balanced by the moment of force  $Q$  about  $F$ , which equals  $Q \times \text{distance } FD$  (perpendicular to  $Q$ ). Hence,  $Q = P \times \frac{EF}{FD}$ .

Since the forces  $P$  and  $Q$ , and the reaction  $R$ , acting at  $F$ , must be in equilibrium, they must form a closed force triangle; and knowing the directions and magnitudes of  $P$  and  $Q$ , we can find the direction and magnitude of  $R$ , which is represented by the closing side of the force triangle; the vertical component of  $R$  is then found as shown in Figure IV. Figure IV is a diagram prepared from an X-ray photograph of an actual female pelvis. On it are superposed the assumed directions of the forces, the force triangles which were drawn to scale, and the vertical components of  $R$  determined as shown.

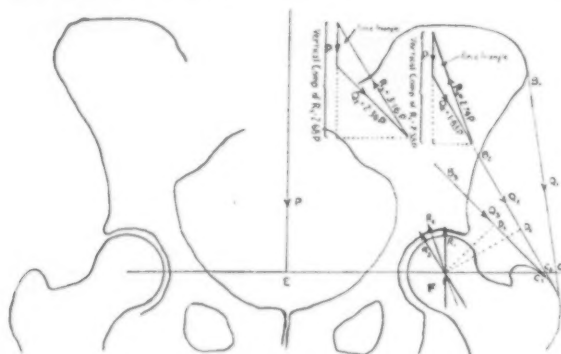


FIGURE IV.

This skiagram was in reality the second one taken. The first skiagram was taken at a distance of eighteen inches, through a diaphragm, with the patient in the recumbent position; the skiagram appeared to show a slight amount of distortion of the head of the femur. Hence a second photograph was taken of another female subject in the

erect position, at a distance of six feet, without a diaphragm. This, as was to be expected, was faint; but Figure IV was prepared from it without difficulty.

The values of the forces were calculated for both cases, and are tabulated below (Table IV); a comparison will show that the results are not greatly different.

#### Discussion.

From these results it appears that even when any angularity of muscular action is taken into account, the vertical force at the head of the femur is not much different from that assumed in Section I—that is, approximately 2.5 times the weight of the trunk plus one leg. In any case, the difference is an addition, tending to increase the force. The variation is from 2.5 to 2.9, approximately 15%, or  $\pm 7.5\%$  from the mean.

In order to check these results as far as possible, a model of the pelvis and the head of the femur was constructed. This is illustrated in Figure V. The shape of

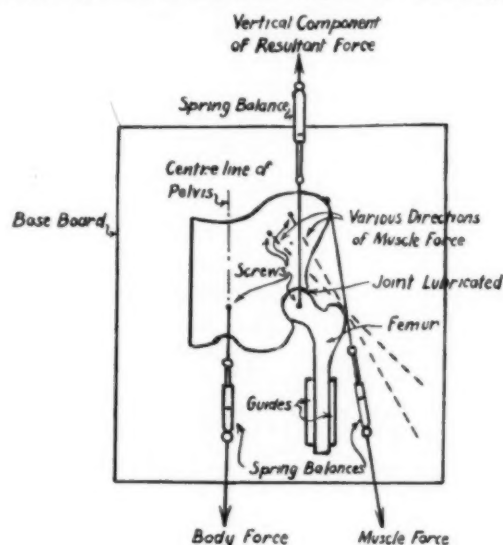


FIGURE V.

the pelvis *et cetera* was taken directly from the second of the X-ray photographs mentioned above, full size, and

TABLE IV.  
A. Case I: Skiagram I (subject horizontal, distance eighteen inches).

Direction of $Q$ .	Distance $EF$ . (Inches.)	Distance $FC$ . (Inches.)	Value of $Q$ .	Value of $R$ .	Vertical Component of $R$ .
Approximately vertical.	4.25	2.75	$\frac{4.25}{2.75} \times P = 1.55 P$	$2.55 P$	$2.55 P$
$60^\circ$	4.25	2.05	$\frac{4.25}{2.05} \times P = 2.07 P$	$3.0 P$	$2.82 P$
$45^\circ$	4.25	1.60	$\frac{4.25}{1.60} \times P = 2.66 P$	$3.56 P$	$2.96 P$

B. Case II: Skiagram II (subject erect, distance six feet, Figure IV).

Direction of $Q$ .	Distance $EF$ . (Inches.)	Distance $FC$ . (Inches.)	Value of $Q$ .	Value of $R$ .	Vertical Component of $R$ .
Approximately vertical.	3.67	2.55	$\frac{3.67}{2.55} \times P = 1.44 P$	$2.44 P$	$2.44 P$
$60^\circ$	3.67	2.0	$\frac{3.67}{2.0} \times P = 1.83 P$	$2.74 P$	$2.58 P$
$45^\circ$	3.67	1.56	$\frac{3.67}{1.56} \times P = 2.36 P$	$3.16 P$	$2.68 P$

was constructed out of five-ply timber; the ball and socket joint was made as circular and as smooth as possible, and the surfaces were lubricated with light grease. The backs of the pelvis and femur shapes were made very smooth, and mounted on a large piece of five-ply, also very smooth, so as to reduce friction as much as possible. The femur was placed in guides so that its motion was restricted to the vertical.

The forces were applied by means of spring balances attached by cords to screws placed at the required places on the model. A unit of eight pounds was applied vertically at *E*, and the forces at *F* and *B* were adjusted until the pelvis assumed the horizontal position. The force at *F* was kept vertical so as to measure the vertical component of the resultant, the horizontal component being taken by the guides of the femur.

The results in general agreed with the theoretical values to within 5% to 10%; this was considered sufficiently accurate to confirm the method of calculation.

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#### AMNIOPLASTIN IN ABDOMINAL SURGERY.

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THE problem of unwanted adhesions within the abdominal cavity has baffled surgeons up to the present time. The aim of this paper is to present a case which illustrates an apparently successful use of amnioplastin to prevent adhesions in an abdominal section. Although adhesions may form anywhere in the abdomen, apparently without adequate cause, it is recognized that injured surfaces are more likely to adhere, and reperitonealization has been the sheet-anchor of the modern surgeon. However, the suture materials used to hold the peritoneum in place themselves tend to cause irritation and therefore adhesions. It yet remains to be seen whether some such suture as plastigut, produced by J. J. Bellas,<sup>(1)</sup> which is said to be non-irritating, will solve this difficulty.

Other efforts have been made to evolve some kind of fluid which, introduced into the abdomen, will prevent adhesions by lubrication or by keeping the surfaces apart. Trials have been made of normal saline solution and of papain solution, introduced by B. P. Mullen,<sup>(2)</sup> 50 milligrammes of papain being used to one litre of Ringer's solution. These latter methods, if really successful in preventing adhesions, would involve a high degree of risk for should infection supervene, adhesions could not then form to shut off the infection and localize it, and generalized peritonitis would immediately occur. This danger would not exist with amnioplastin, the action of which is purely local.

After a perusal of the article by Chao, Humphreys and Penfield,<sup>(3)</sup> detailing the method of using amnioplastin (specially prepared human amniotic membrane) for the prevention of adhesions in brain surgery, their suggestion that it might be of use in the abdomen having been noted, it occurred to one of us (A.R.S.O.), who had a case of recurring adhesions between the bladder and pelvic colon and sidewall of the pelvis, that the use of amnioplastin might be attended with success. It was suggested that even if adhesions were prevented at one spot they might form in numerous other places, and the patient would be no better off. Against this argument it seemed that if only the bladder could be protected the attempt would be abundantly worth while. Consequently the preparation of amnioplastin was proceeded with according to the method of L. J. Le Vann,<sup>(4)</sup> to eliminate the fat content, which was considered undesirable. At this stage we found that workers at the Walter and Eliza Hall Institute and at the Women's Hospital, Melbourne, were engaged in research on this membrane. From Dr. Kellaway we were able to obtain some membrane sterilized dry and freed from fat.

Our patient was a woman, who had undergone a number of abdominal operations, and finally pelvic adhesions necessitated operation in 1940. Her symptoms still persisted, however, and on April 25, 1941, operation was undertaken along the following lines.

It was found best to cut the amnioplastin into pieces about the size of a postage stamp, place them along the raw edges overlapping them like tiles, and iron out the irregularities with a dry swab on a stick. The adhesions that had to be separated were on the left side between a loop of pelvic colon and the anterior wall of the pelvis, and between the bladder and the pelvic wall. Peritoneum was carefully sutured over the raw surfaces with catgut. Then a piece of the delicate membrane was removed from its gauze envelope and an attempt was made to introduce it into the abdomen; it was used dry, as suggested by Dr. Kellaway. It was found that the forceps readily tore it, and on touching the edge of the wound it doubled up. In the end we had the membrane hopelessly tangled round the forceps. The pieces were five by four inches and three by three inches in size; we found this too large. Cut into smaller sections, they were placed along the sutured edges and covered also the catgut sutures. It was found that these pieces adhered not only to the parts, but also to any metal instrument, and any efforts

to smooth out bubbles or creases therefore pulled the membrane off again. This difficulty was finally overcome by the use of a dry swab of gauze on a stick, which smoothed out irregularities very neatly and did not adhere at all. The pieces of membrane overlapped and completely covered all injured surfaces, remaining in place by cohesion.

Now it is probable that the membrane would adhere best to the raw edges; but should the other side of the membrane become adherent to a portion of bowel, these two structures would be glued together by the thin piece of membrane. If this were to happen, we relied on the statement of Chao, Humphreys and Penfield that the membrane became completely absorbed in a month, in which case the two structures should separate again, as healing of any injured areas would then be complete. Probably a double layer of membrane would be better. Perfect asepsis, of course, is essential.

Dr. Kellaway states that experiments on animals have not been uniformly successful; but that may be due to the introduction of a foreign protein by the use of human amnioplastin. The use of human amnioplastin on the human being eliminates this possible source of trouble. Apropos of this, it seems that one cause of generalized adhesions may be the inadvertent introduction during operation of foreign protein in the form of dust or solutions.

The patient made a good recovery from the operation. There was slight trouble from a collection of serum in the subcutaneous fat, which was responsible for an irregularly elevated temperature of about 99° F. for some time and later caused the wound to break down superficially. Healing was, however, quite complete before the patient left hospital in three weeks' time. She is now walking about comfortably, and states that she has lost the dragging feeling she had on the left side before she entered hospital. The following is a brief account of the case.

E.O.D. was a married woman, aged thirty-two years. On September 3, 1934, when she was about four months pregnant, she had a miscarriage. On October 24, 1934, she gave a history of pain and uterine bleeding. Occasional slight dyspareunia was present. On vaginal examination the uterus was found to be retroverted. A modified Gilliam's operation (curettage and section) was performed.

On August 7, 1935, she gave a history of irregular uterine bleeding of six months' duration. Curettage was performed and the remains of an early pregnancy were found. Thereafter the patient gradually began to complain of more pain, of irregular menstruation and of dyspareunia. She had definite tenderness in the left fornix.

On March 19, 1936, total hysterectomy was performed, with removal of part of the left ovary, which was cystic. Thereafter pain and tenderness on the left side gradually became more troublesome, and about four months later vague bladder symptoms appeared, as well as frequency of micturition and pain. Dyspareunia continued and acute tenderness was present in the left fornix.

On October 22, 1940, abdominal section was performed, as a vaginal examination, a barium meal examination and cystoscopy suggested adhesions. A large mass of adhesions was found between the bladder, the pelvic colon and the left wall of the pelvis, the remains of the ovary lying within the mass. This mass was carefully removed and the raw surfaces were covered with peritoneum.

On April 25, 1941, as the previous symptoms and signs persisted, abdominal section was again performed; this time amnioplastin was used. A left paramedian incision was made, the *rectus abdominis* muscle being retracted outwards. There was troublesome oozing. When the peritoneum was opened adhesions were seen between a loop of pelvic colon and the posterior surface of the left *ramus superior* of the pubis. Then two bands of adhesions were noticed between the left edge of the superior surface of the bladder and the side wall of the pelvis. These were separated also. Great care was taken not to disturb the rest of the abdomen. The raw surfaces were then covered with peritoneum by catgut sutures, and the whole of the sutured edges were encased in amnioplastin, as has been described. The abdomen was closed in the usual manner, but no chromicized gut was used. Continuous catgut sutures were inserted in the fat. Recovery was uneventful except for a slight rise in temperature due to a collection of serum, which eventually caused the wound to break down superficially. The patient left hospital in three weeks, healing

being complete and her temperature normal. Her temperature has remained normal up to the present time. This is satisfactory, as she had had rises in temperature for weeks before her admission to hospital. Examination of the urine revealed no abnormality. She has been relieved of her bladder symptoms and the dragging pain of which she complained before the operation.

On May 26, 1941, vaginal examination revealed some tenderness of the area of the trigone of the bladder, but no tenderness in the right or left fornices.

#### Summary and Conclusions.

1. The question of abdominal adhesions has been discussed and a method of using amnioplastin for their prevention has been evolved.

2. An operation with the use of amnioplastin for this purpose has been performed for the first time in Australia, as far as we are aware, and is described.

3. We are satisfied that the preparation used was sterile and caused the patient no inconvenience. We should not hesitate to use it again.

4. The patient made a good recovery and was relieved of her bladder symptoms and the dragging pain of which she complained before the operation; her normal temperature was restored and vaginal examination revealed no tenderness in the left fornix.

5. While we realize that a large number of cases would be necessary to establish fully the value of the procedure, we hold that our results are sufficiently encouraging to warrant further trial.

#### Acknowledgements.

Our thanks are due to Dr. Charles Kellaway, of the Walter and Eliza Hall Institute of Research, Melbourne, for kindly forwarding us supplies of specially prepared amnioplastin; our thanks are also due to Dr. E. Neil McQueen for the efficiently induced and smooth anaesthesia, without which the operation could not have been carried out successfully.

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#### Reviews.

##### FRACTURES AND JOINT INJURIES.

LAST year we reviewed Watson-Jones's "Fractures and other Bone and Joint Injuries" in its first edition. Now, only one year afterwards, it arrives in its second edition.<sup>1</sup> We described the first edition as a credit to the author, to its school and to British surgery, as the best book on its subject that England has produced, and one of the best produced anywhere. The second edition maintains that standard, and has improved it. We had some criticisms to make in our review of the first edition. One of these referred to the absence of any reference to fat embolism. That omission has been made good in the second edition. We referred also to absence of any reference to hydatid disease of bone, but that omission still exists. Perhaps Dew's monograph is not available in the libraries of Liverpool; but let us hope that before the time a third edition is due, the author may have an opportunity of consulting it. Our criticism of the first edition mentioned that though the author advised traction by a pin through the tibia in Chapter 31, and deprecated traction by transfixion of the calcaneus, the illustrations showed traction by the calcaneus. This contradiction remains. We note as an improvement in the second edition, on page 517, the introduction of an illustration of an overhead frame, as used in fractures of the femur. No illustration of an overhead frame was admitted into the first edition. Our criticisms are directed towards improvement of a book that is already excellent, and that well deserves the popularity it has achieved and will continue to hold.

<sup>1</sup> "Fractures and other Bone and Joint Injuries", by R. Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S.; Second Edition; 1941. Edinburgh: E. and S. Livingstone. Super royal 8vo, pp. 735, with 1,050 photographs, skiagrams and diagrams. Price: 50s. net.



# The Medical Journal of Australia

SATURDAY, OCTOBER 4, 1941.

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## ORTHOPÆDIC MEDICINE AND SURGERY.

THE branch of medicine known as orthopædics was not widely recognized as a specialty in Great Britain and the Dominions until the war of 1914-1918 left such an enormous number of men so mutilated and crippled that reparative surgery became an obvious and urgent necessity and plans were made for its inception. That this was due to the vision and driving force of the late Robert Jones is well known. His was the national scheme of central orthopædic hospitals and after-care clinics that covered the face of England like a network and later on spread to Scotland and Northern Ireland. He it was who initiated special courses of training for surgeons, that they might be able to deal with the special problems, many and diverse, arising in the reparative treatment of the crippled soldier. He knew that this work called for special knowledge and also for the expenditure of a great deal of time in detailed attention to post-operative treatment and rehabilitation. In a letter on the subject of orthopædic treatment to Sir Alfred Keogh, then Director-General of Medical Services, he wrote in February, 1916, the following words: "The general surgeon, however brilliant, when confronted with these cases is unable to steer them in the right direction or to prognose their future." Frederick Watson, from whose "Life" of Robert Jones<sup>1</sup> this quotation is made (page 165), states that it could not be anticipated that Jones's proposal for the establishment of a central orthopædic hospital, combining all the necessary departments and staffed by expert men under a director, would be accepted without a struggle. Opposition was made all the more likely because of Jones's preference for a staff composed of the younger generation of surgeons "with minds sufficiently flexible to grasp new ideas, and with sufficient energy to bear the strain that orthopædic surgery involves". However, the War Office was sympa-

thetic and Jones won his day. These were spectacular happenings and it is small wonder that Robert Jones is always mentioned, at least in British circles, as one of the founders of modern orthopædic surgery. If any one man had to be chosen from among British surgeons as the father of modern orthopædic surgery, the man named would be Hugh Owen Thomas, the uncle of Robert Jones, whose assistant Jones was and who was probably "more responsible than anyone else for establishing the basic principles of modern practice in many of its fields". Though we remember Hugh Owen Thomas and his nephew Robert Jones as having placed modern orthopædics on its present footing in British lands, we must not forget that in many other countries there were those who made important contributions to its art and adorned its practice.

It is important to remember that the chief characteristic of modern as compared with early orthopædics is the insistence on restoration of function as well as on anatomical repair. By keeping this in mind we shall never make the grievous error of regarding the orthopædics of today as being concerned only with the repair of deformity. If the importance of function is continually kept in view there will be little difficulty in going to the root of the matter. This was well expressed by Robert Jones when he wrote on the orthopædic outlook in military surgery in *The British Medical Journal* of January 12, 1918, that the orthopædic problem could be divided into two distinct parts—preventive orthopædics and corrective orthopædics. He held that the latter was more especially the department of trained orthopædic surgeons and that the preventive aspect required the help of every surgeon who had to treat wounded men at any stage, especially the early stage. Prevention in these circumstances is a branch of what has been described in these pages on a previous occasion as preventive surgery. If we think of orthopædics in civil practice, it is clear that the idea of prevention must be carried further still. This idea has been associated with orthopædics ever since the word was first used. Castiglioni in his recently published "History of Medicine" states that the term orthopædics was first used by Nicolas Andry in 1741 when he published a book entitled "*L'Orthopédie ou l'art de prévenir et de corriger dans les enfants les difformités du corps*". When in these modern times we take an unction to our souls and pride ourselves in our up-to-the-last-minute or new outlook on matters medical or surgical, we would do well to think of the man who defined orthopædics two hundred years ago.

The specialist in orthopædics has thus a wide range of activities. Like most others who devote special study to a branch of medicine, he must be concerned with both cure and prevention. On the curative side he aims at restoration of function and lessening of deformity. His treatment may, like that of general surgeons, involve operation, but if it does, he has to be more meticulous than the general surgeon in his after-treatment. Recovery of function may be slow and an orthopædic surgeon does not therefore allow his patient to wander from his care until he is satisfied that supervision is no longer necessary. It is the custom in Australian hospitals for orthopædic surgeons to attend the out-patient department as well as the wards, and this gives them a complete knowledge of their patients, which, it may be remarked in passing, should arouse the envy of general surgeons who more often

<sup>1</sup> "The Life of Sir Robert Jones", by F. Watson; 1934. London: Hodder and Stoughton. Royal 8vo, pp. 327, with plates. Price: 12s. 6d. net.

than not lose sight of their patients once they have been discharged from the wards. The orthopaedic surgeon must call to his aid different forms of physical therapy, he must know when and how to apply them, what they may be expected to achieve, and when their use should be discontinued. He cannot do this unless he has studied the subject, and certain forms of physical therapy therefore become part of orthopaedics. This point has been well made by Norman Capener in recent correspondence that has taken place in *The British Medical Journal*. On the preventive side the orthopaedic surgeon following the division of his specialty described by Robert Jones will, as already stated, indulge in preventive surgery. But as he approaches the original and obviously the complete definition of orthopaedics indicated two hundred years ago, he will enlarge his interest and extend his activities. If he is to prevent deformity, he must be concerned with physical training, nutrition, hygiene, and to go to the extreme limit, genetics. In other words he will join hands with the physician, the general practitioner and the hygienist. Though in theory his special field is small, in essence it is of enormous extent. Thus we can agree that the term orthopaedic surgeon, though widely used, is too restricted. The specialty therefore becomes orthopaedic medicine and surgery or orthopaedics, and the specialist an orthopaedic surgeon and physician or an orthopaedist.

### Current Comment.

#### THE USE OF SULPHONAMIDES IN CHOLECYSTITIS AND CHOLANGITIS.

FROM the empiricism of sulphonamide therapy in many diverse pathological conditions is gradually emerging a more rational basis for their use. In those diseases in which the causative organisms are not constantly of the one type or in which no one organism has been regularly isolated, it cannot be hoped that great success will attend the exhibition of these drugs. In acute rheumatic fever there is still a divergence of opinion as to the efficacy of the sulphonamides—at the moment there would seem to be a place for their use in small doses during convalescence and as a means of reducing the high incidence of exacerbations of this disease. In appendicitis the chief value of the sulphonamides would appear to be in the treatment of post-operative pulmonary complications and peritonitis, and in the local treatment of appendiceal abscesses. The mechanical obstruction either to the lumen of the appendix or to its blood supply is one of the most important aetiological factors in acute appendicitis and precludes the successful treatment of the disease by chemotherapy. Although an infective agent probably plays an important part in the development of peptic ulcers, it is undoubtedly the mechanical factor of gastric motility and the chemical factor of hyperacidity which inhibit the healing of some peptic ulcers and thus result in subsequent chronicity of the lesions.

Since the sulphonamides are excreted in the bile, and although there is also a mechanical factor in the aetiology of most cases of cholecystitis and cholangitis, it is perhaps possible that chemotherapy will play a part in the future treatment of these diseases. W. W. Spink, G. S. Bergh and Jean Jermsta<sup>1</sup> have administered sulphanilamide and sulphapyridine orally to patients several months after the performance of a cholecystectomy and choledochostomy, accompanied by T-tube drainage of the common bile duct. Bile specimens were collected, and in these

specimens they were able to demonstrate appreciable concentrations of sulphanilamide and sulphapyridine when compared with the blood levels. On the ability of the sulphonamides to diffuse to most tissues of the body depends partly their importance in chemotherapy. However, the solubilities of the various sulphonamides are not directly related to the facility with which they diffuse into or are excreted in the bile, for these authors have shown that in all their four cases the maximum level of the sulphanilamide in the bile was lower than the level of the sulphanilamide in the blood, whereas in two of their three cases a much greater concentration of sulphapyridine was obtained in the bile when compared with the blood. Similarly, it is known that sulphathiazole passes over much less readily into the cerebro-spinal fluid than does either sulphanilamide or sulphapyridine. Again, sulphapyridine is excreted more slowly in the urine than is either sulphanilamide or sulphathiazole.

The impairment of hepatic function, shown to be present by what are known as the liver function tests in many patients suffering from diseases of the biliary tract, must be advanced tentatively as an argument against the indiscriminate use of the sulphonamides in the treatment of cholecystitis and cholangitis, for C. J. Watson and W. W. Spink<sup>2</sup> have shown that the administration of sulphanilamide in the usual doses is followed by some evidence of dysfunction of the liver, such as urobilinogenuria, elevation of the serum bilirubin or frank jaundice. These authors reported sixteen cases of jaundice following sulphanilamide therapy, but in only one had jaundice been noticed following the use of sulphapyridine. Although increased haemolysis, with resulting increased formation of urobilinogen in the bowel (such as may occur after the administration of therapeutic amounts of the sulphonamides) predisposes to urobilinogenuria, it is probable that some degree of impairment of hepatic function is necessary for the appearance of appreciable increases of urobilinogen in the urine. In any case the results of an attempt to confirm this and to determine what degree of impairment of hepatic function is produced by these drugs would be interesting. This could probably best be done by the performance of Quick's hippuric acid excretion tests and prothrombin estimations both before and after the administration of the sulphonamides to patients. While in the present state of our knowledge of the effect of these drugs on the liver and on hepatic function it behoves the clinicians to be chary of prescribing them indiscriminately to patients suffering from cholecystitis and cholangitis, it may probably be stated correctly that until such an investigation is carried out, only a slight risk would be incurred if these drugs were given a trial in the treatment of cholecystitis and cholangitis in all cases except those presenting more than minimal impairment of hepatic function. It is indeed strange that the reports in the literature dealing with the treatment of cholecystitis and cholangitis by the sulphonamides have been so scanty; but it may be assumed that this state of affairs will not persist for long.

#### HEPARIN AND THROMBOSIS.

THERE have recently been published the proceedings of a symposium on heparin and thrombosis held at a joint meeting of the Swedish Society of Surgeons and the Swedish Society for Internal Medicine in Stockholm.<sup>1</sup> Heparin was discovered by William H. Howell, of Johns Hopkins Hospital, Baltimore, in 1916, and its anticoagulant properties were investigated. He suggested that this substance might be of clinical use "in cases of venous thrombosis in man", and this hint has been actively taken up in a number of countries. In 1939 the Swedish investigator Erik Jorpes contributed a brochure on heparin to the Oxford Medical Publications, and many articles embodying research and clinical observation have emanated from the Toronto school. The end in view of these activities has been the heparization of a patient as a

<sup>1</sup> *Surgery*, June, 1941.

<sup>2</sup> *Archives of Internal Medicine*, April, 1940.

<sup>3</sup> *Acta Medica Scandinavica*, Volume CVIII, Fascicule 2, 1941.

prophylactic against post-operative thrombosis and further as a check on thrombotic developments already begun in any part of the body—limb, uterus, brain or retina. In the Toronto school it has been claimed by R. D. McClure and C. R. Lam that preliminary treatment with heparin, 20 milligrammes per hour given intravenously by the drip method, will allow operative procedures on the vascular system hitherto impracticable or dangerous.<sup>1</sup> The general theory is that heparin is Nature's own anticoagulant; it would appear to be produced by Ehrlich's mast cells, and in normal existence neutralizes thromboplastic agents and keeps the blood fluid. The contention is sound that medication by a naturally occurring substance developed in evolution is likely to be superior in action to a foreign chemical compound and less likely to produce undesired complications.

As might be expected, the obstetrician, with whom post-partum hæmorrhage is a nightmare, will need some convincing that an anticoagulant can be administered without danger to his patient, and this aspect of the problem has in fact received considerable attention, though uterine operations other than those connected with parturition have constituted the majority of those investigated and recommended. One of the Swedish obstetricians, Herman Leissner, states that the first heparin injection should be given not earlier than twelve hours and, perhaps better, not earlier than twenty to twenty-four hours after delivery. One interesting fact emerges from the discussion, and that is the lack of dependence of bleeding time on coagulation time. A delayed coagulation time may coexist with a normal bleeding time owing to two factors, one the active contraction of vessels, and the other the liberal outpouring of kinase in the wounded area, which kinase completely inhibits the heparin action. Obviously when chronic hæmorrhages are occurring or are likely to be revived, as in gastric ulcer, hæmorrhoids and the like, heparin therapy is contraindicated.

Two warnings have been voiced respecting this potent physiological substance; one is that within two hours after the injection, malaise, rigors, headache, joint pains and pyrexia often develop. It is claimed that purification of the heparin completely removes this disability. The other alleged disadvantage is much more serious, and it is that following the period of weakened coagulation a negative phase may supervene with corresponding increased coagulative potency, and this might well precipitate the dreaded thrombosis. Some of the speakers at the Swedish discussion pleaded for caution and a *festina lente* attitude, and with this most surgeons and physicians will assuredly agree.

#### ERYTHROCYTE MEASUREMENT BY DIFFRACTOMETER.

It is a tribute to the pioneer genius of Thomas Young, physiologist, physicist and Egyptologist, that over a hundred years elapsed before his suggestion regarding the use of diffraction methods for the measurement of fine fibres and animal cells was adopted in medical science. Young, as is well known, advocated the wave theory of light with vibrations transverse to the path of propagation and, though this met with savage and vindictive opposition from the lawyer Brougham, it eventually won the day, and even now, with a quantum basis of radiation popular amongst physicists, cannot be explained away, as indeed the announcement of wave-lengths in wireless broadcasting tells us. As stated, a simple diffraction method was devised by Young for the quantitative measurement of pus cells and corpuscles, and also fine fibres; but his "eriometer" failed to receive the approbation either of the medical practitioner or of the textile technician. In 1919 Pijper in South Africa rediscovered the diffraction technique for examining cultures of microorganisms,<sup>2</sup> and last year a diffractometer was devised by Russell Haden for the

measurement of the diameters of red cells and is now on the market.<sup>3</sup> Young, Pijper and Haden used white light for the diffraction fringes, and it was inevitable that an improvement would be made in the apparatus by the employment of monochromatic light, for in the optical system no correction for chromatic aberration is necessary and, further, the actual measurement of the fringes is more easily carried out. The latest form of diffractometer<sup>4</sup> has the further advantage that the material used in the apparatus is inexpensive and high refinement in the optical parts is not necessary. Whether this instrument will supplant the microscope with well ruled grating, time will tell.

#### CHEMOTHERAPY OF TUBERCULOSIS.

The results of chemotherapy (or indeed any other type of treatment) in tuberculosis are necessarily difficult to evaluate. The disease is slow and its progress is apt to be interrupted by long periods of quiescence or apparent inactivity; furthermore, in the majority of cases tuberculous lesions tend to heal; the patient may recover whatever the treatment, or in spite of it. In laboratory experiments there are many difficulties. Tuberculosis in the guinea-pig is acute; the disease as it usually occurs in adult humans cannot be reproduced in the guinea-pig. One must therefore be careful not to attach too great importance to any new chemotherapeutic procedure in tuberculosis. At the same time, any well-considered report unaccompanied by extravagant statements is worthy of study. Such a report is that recently presented by H. Harris Perlman, Herman Brown and George W. Raiziss.<sup>5</sup> They point out that several investigators have remarked on the possible value of cinnamic acid or its salts in tuberculosis. As far back as 1893, Landerer gave cinnamyllic acid intravenously for surgical tuberculosis and was convinced of its value. Cinnamic acid is a constituent of balsam of Peru. Perlman, Brown and Raiziss tested thymol, menthol, eucalyptol and cinnamic aldehyde, all of which are stearoptens (the solid portions of volatile oils). They also studied alkyl phenols and their halogenated derivatives, and they injected solutions of four amino-acids into tuberculous guinea-pigs with the object of discovering whether they prevented loss of body weight. The stearoptens and phenols and their derivatives were suspended in oil and administered to guinea-pigs by intramuscular injection. The animal was infected by the subcutaneous injection of 0.00005 milligramme of a virulent strain of bovine tubercle bacilli, and three days later intramuscular injection of the drug to be tested was commenced; thereafter injection of the drug was repeated at intervals of five days. Controls were inoculated and then given intramuscular injections of oil only. The animals were weighed and examined regularly, and their organs and tissues were examined after death. Perlman, Brown and Raiziss found that the administration of thymol, menthol, eucalyptol or cinnamic aldehyde in a 5% suspension reduced the severity of the infection and prolonged the life of the animal treated. In many instances tubercle bacilli could not be recovered from the organs. Better results were obtained when 10% suspensions were used, the most effective being eucalyptol and menthol combined, then eucalyptol alone. Combinations of eucalyptol and thymol and of menthol and thymol were little less effective. Cinnamic aldehyde was not used in these higher strengths. The alkyl phenols and their derivatives had no beneficial effect; neither had the amino-acids. Perlman, Brown and Raiziss merely state the results of their experiments, making no attempt to foist some allegedly miraculous drug on an eager profession. Their paper is of value; it should stimulate further study. Perhaps someone will find a drug that will cure the guinea-pig of tuberculosis. The human tuberculous subjects will then have justification for taking fresh hope.

<sup>1</sup> The Journal of the American Medical Association, Volume XCIV, 1940, page 2085.

<sup>2</sup> Journal of the Medical Association of South Africa, Volume XIV, 1918, page 211.

<sup>3</sup> The Journal of Laboratory and Clinical Medicine, Volume XXV, 1940, page 399.

<sup>4</sup> Richard T. Cox and Eric Ponder: "A New Form of Diffractometer", The Journal of General Physiology, May, 1941.

<sup>5</sup> The American Review of Tuberculosis, July, 1941.



## Abstracts from Medical Literature.

### DERMATOLOGY.

#### The Effects of Sulphonamide Compounds upon Lupus Erythematosus.

H. W. BARBER (*The British Journal of Dermatology and Syphilis*, January, 1941) has carried out observations upon the effects of the sulphonamide group of drugs on *lupus erythematosus*. Nearly all his observations concerned "Prontosil album" and "Dagenan". In the majority of cases the author thought that a chronic streptococcal infection was responsible for the eruption. Nearly all cases were investigated to try to determine the presence of latent tuberculous or infection with pathogenic streptococci or other organisms. The author noticed that after taking "Prontosil" or "Dagenan" for eight to fourteen days the majority of patients began to feel acutely ill and the temperature rose sometimes after an initial rigor. Sometimes a transitory generalized scarlatiniform eruption appeared which was regarded as due to liberated streptococcal toxin. When the reactions occurred the drug was discontinued and the symptoms rapidly subsided. With subsequent administration of the drug the effects varied in different cases. In some the taking of a single tablet resulted within a very short time in a violent reaction. In others reactions have gradually diminished with continuance of the drug. The therapeutic effect on the *lupus erythematosus* on the whole has been good—sometimes strikingly so. The author is unable to state at present how permanent the results will be. He considers that the undoubted value of the sulphonamide group of drugs in long-standing cases of *lupus erythematosus* in which it is thought that a chronic and widespread streptococcal invasion is responsible, is that at long last they afford a method of attacking latent and inaccessible foci of infection. The author suggests that (a) *lupus erythematosus* may be of either tuberculous or streptococcal origin; (b) when the disease has been due to streptococcal infection, characteristic reactions to treatment with sulphonamides have been observed, with subsequent lessening of the eruption in a high proportion of cases, whereas when tuberculous infection was apparently responsible, the reactions have not occurred nor has the eruption been effected; (c) the view is put forward that these reactions are due to the liberation of streptococcal toxin by the action of the sulphonamides on latent foci of infection and are not examples of drug fever.

#### Herpes Simplex.

C. C. THOMAS (*Archives of Dermatology and Syphilology*, May, 1941) reports a case in which *herpes simplex* occurred periodically in a twenty-six year old Negress after the age of fifteen. After an attack of arsenical dermatitis the attacks became more frequent and widespread, occurring at intervals of one and two weeks and involving over a period the entire cutaneous surface except that of the face, scalp, neck, forearms and legs. Sometimes multiple groups of lesions developed, having during one outbreak

a zosteriform distribution. Herpes virus was demonstrated by the production of keratitis and encephalitis in a rabbit after corneal inoculation of material from one of the lesions. It was eventually decided to attempt desensitization by injections of autoserum. Some blood was withdrawn just as a new outbreak of lesions was occurring. The serum was separated by centrifugation and was stored in sterile ampoules with tricesol as a preservative. Twice a week 0.2 cubic centimetres of this autoserum was injected intradermally, the same site being used for four successive injections. This treatment was carried out for ten weeks with three different batches of autoserum. The patient has been completely free of any herpetic lesions for a year after the last injection.

#### Vernix Caseosa as a Manifestation of Vitamin A Deficiency.

J. V. STRAUMFJORD (*The Western Journal of Surgery*, June, 1940) concludes that *vernix caseosa* is a manifestation of a deficiency of vitamin A in the new-born and that it represents disturbances in cornification analogous to the cutaneous changes accompanying keratomalacia and other manifestations of deficiency of vitamin A. He administered 50,000 to 100,000 units of vitamin A daily to twenty-five pregnant women and found that only four had babies with much or a moderate amount of *vernix caseosa*; this was a smaller proportion than in a control group.

#### Erythema Elevatum Diutinum.

F. C. COMBES AND S. M. BLUEFARB (*Archives of Dermatology and Syphilology*, September, 1940) record the history of a patient whose condition had been previously diagnosed tentatively as lymphoblastoma, xanthoma, *mycosis fungoides*, multiple idiopathic hemorrhagic sarcoma and *erythema elevatum diutinum*. The eruption first appeared on the neck and the rest of the lesions within the next two months. They were generalized and consisted of variously sized nodules and plaques, ranging from 0.5 to 4.0 centimetres in diameter. Small aggregate lesions were present about the ears and nose. On both sides of the neck posteriorly were clumps of slightly larger lesions. Similar isolated lesions were situated on the chest and back. On the extremities there was a tendency towards localization, especially about the wrists and even on the knuckles and dorsum of the proximal articulations of the fingers. The lesions were circular or irregularly oval, arising abruptly from normal skin. The larger lesions were plateau-like, whilst in others the centres were perceptibly more elevated than the edges. In none was there any central regression or depression. The colour varied from dusky reddish brown in the larger to orange yellow in the smaller ones. The surface was smooth and devoid of scales. Lanugo hair was absent from the surface of the nodules. On palpation the nodules were firm and infiltrated, but could be lifted freely from the subcutaneous tissues. The Mantoux test, when a dilution of 1 in 100,000 was used, produced no reaction, but with a dilution of 1 in 1,000 it produced a positive reaction. Clinical and cytological examination of the blood revealed no abnormality. X-ray examination revealed no pathological changes in the lungs or bones. Microscopic examination of the epidermis revealed acanthosis. The corium was granulomatous, showing

profuse infiltration with small and large round cells and polymorphonuclear leucocytes. A subacute inflammatory process existed about the blood vessels, and there was hyperplasia of the vessels with toxic necrosis of their walls. The authors quote Weidman and Besançon, who state that as far as they know this is the only dermatosis in which masses of polymorphonuclear cells dominate the picture, apart from such severe acute conditions as erysipelas, cellulitis and perhaps *erythema nodosum*. Graham Little considered that the disease differed from *granuloma annulare* in the absence of discrete nodules.

#### Erythema Nodosum of the Face.

S. M. BLUEFARB AND C. E. MORRIS (*Archives of Dermatology and Syphilology*, May, 1941) report a case of *erythema nodosum* of the face. The commonest location for *erythema nodosum* is the skin over the anterior surfaces of the tibiae. Lesions are frequently seen on the arms and trunk as well, but lesions on the face are rare. The patient was admitted to hospital complaining of a painful rash on her face, of seven days' duration. Three and a half weeks prior to her admission to hospital a sore throat developed, which persisted for about seven days. No internal medication had been used. When she had been well for ten days she noted painful red spots on the cheeks and forehead, and two days later similar lesions appeared on the shins, arms and legs. The face showed a diffuse erythematous blush with tender, purplish red, slightly raised, indurated nodules, the size of a dime to that of a silver dollar, scattered over the forehead and cheeks. Similar lesions were seen on the legs, thighs, forearms and arms. Treatment consisted of rest in bed and administration of sodium salicylate.

#### Neurodermatitis Treated with Hypoglycaemic Reactions.

S. J. TILLIM AND M. T. SQUIRES (*Archives of Dermatology and Syphilology*, June, 1941) state that the group of dermatoses variously considered under the names neurodermatitis, atopic dermatitis and generalized or disseminated neurodermatitis, are amongst the most resistant therapeutic problems in dermatological practice. The remedies which have been tried with more or less indifferent results include symptomatic management, allergic studies and desensitization, actinotherapy, dietotherapy, and oral and parenteral administration of many medicaments. With any of these treatments the condition lasts for months or years. Most of the patients require psychiatric treatment because of an underlying depression and emotional tension. The authors discuss the opinions of various writers as to the aetiology, and decide that the subject is highly controversial. Their interest in the neurodermatoses was aroused by the need for an effective treatment of a stubborn dermatitis in two depressed patients. Since the frequent good effects of insulin shock therapy on the skin were known, these patients were given short courses of mild hypoglycaemic shocks. The gratifying results of the empirical trials led to the treatment of additional patients. From their observation on the use of hypoglycaemic reactions in neurodermatitis, the authors conclude that there is a diathesis, congenital or acquired, which predisposes these persons psycho-

logically to neurodermatoses; and that secondarily these patients exhibit physiological derangement in one or more of the following ways: gastro-intestinal dysfunction, positive allergic reactions, eosinophilia and calcium imbalance. The authors' first patient was treated according to the following schedule: January 23, 40 units at 9.30 a.m. and 60 units at 2.30 p.m.; January 24, 60 units at 2.30 p.m.; and January 25, 80 units at 2.30 p.m. This treatment was continued on January 28, 29, 30, 31. During January 26 and 27, when the patient was already free from itching, her spirits improved so much that she was allowed her first week-end visit home since her admission to hospital. The object in the hypoglycaemic reactions was to produce diaphoresis and some degree of somnolence or relaxation between two and a half to three hours of the injection. The treatments were timed to be terminated by the administration of an adequate amount of dextrose as near to the regular meal time as practicable. No modifications were made in the diet.

## UROLOGY.

### Ruptured Kidney.

It has been shown experimentally by O. S. Lowsley and J. H. Menning (*The Journal of Urology*, March, 1941) that kidneys subjected to trauma causing various degrees of rupture, which are treated by using pads of fat held in position by ribbon gut, regain their functional capacity. Some kidneys have areas of contraction due to scar tissue, but the intervening renal tissue is preserved in good condition. On the other hand, failure to open the capsule when the kidney has been ruptured results in much fibrosis and some hyalinization. Given modern aseptic conditions, the authors believe that operation should be undertaken in all cases of ruptured kidney if bleeding persists for twenty-four hours. The objects of the operation are: (a) evacuation of blood clot, (b) control of hemorrhage, (c) nephrostomy if necessary, (d) repair of kidney with ribbon gut. Such exploratory operation is considered more conservative than hopeful waiting.

### Primary Renal Calculus.

H. RANDALL (*The Journal of Urology*, November, 1940) has produced evidence that stones of pure uric acid, oxalates or phosphates may be deposited by crystallization on the calcium plaques which he had previously described in renal papillae. He therefore concludes that primary renal calculus is only a symptom and always originates as a slow crystallization of urinary salts upon a lesion of the renal papilla. Calculi associated with hyperparathyroidism, hypovitaminosis, some forms of renal infection and nephrocalcinosis belong to a different form of papillary pathology associated with tubular inspissation of salts (calcium infarction) and represent the end results of hyperexcitatory states.

### Estimation of the Size of the Prostate Gland.

E. L. PIERSON AND S. A. WILSON (*The Journal of Urology*, January, 1941) present a new method of estimating the size of the prostate gland, and claim

that it is more scientific and more accurate than any other means except cystoscopy. Further, it avoids trauma to the posterior part of the urethra. A Foley bag catheter is passed into the bladder, 3% sodium iodide solution is injected into the bladder and 40% iodide solution into the bag. Skiagrams are taken with the bag drawn down in contact with the prostate in the anteroposterior position. A small balloon is then passed into the rectum and filled with 6% iodide solution and exposures are made with the patient in the lateral position. Precise measurements of the relative distances between the bag, the pubis and the rectum give the size of the prostate gland. By this means the authors determine whether transurethral resection or prostatectomy is to be preferred.

### The Use of Sulphathiazole in Urinary Infections.

EXTENSIVE studies of the bacteriostatic and bactericidal effect of sulphathiazole on six of the organisms most commonly found in the urine have been carried out by H. F. Helmholz (*The Journal of Urology*, January, 1941). A concentration of 200 milligrammes per 100 cubic centimetres should prove sufficient for the cure of practically all infections except those due to *Pseudomonas aeruginosa*, which will probably require 300 milligrammes per 100 cubic centimetres. The effectiveness of the drug for the various bacteria on an ascending scale is as follows: *Pseudomonas aeruginosa*, *Streptococcus faecalis*, *Escherichia coli*, *Aerobacter aerogenes*, *Proteus ammoniae*, and *Staphylococcus aureus*. The bactericidal range is from 300 to 25 milligrammes per 100 cubic centimetres. There is some variation in the effect of the drug at different pH levels, particularly marked in regard to *Streptococcus faecalis*.

### Contact X-Ray Therapy for Bladder Tumours.

L. S. GOIN, E. F. HOFFMAN AND S. S. CRANE (*The Journal of Urology*, December, 1940) have treated seventeen carcinomata of the bladder base by the Chaoul technique after surgical exposure of the lesion. The cases selected were those unsuitable for partial cystectomy and those which did not respond to fulguration. Doses up to 30,000 r have been administered to an area three centimetres in diameter in weekly fractional doses of 8,000 r. In most of the cases "immediate and rather spectacular cure" of the primary tumour has occurred. Sufficient time has not elapsed to determine whether this will be permanent. Biopsies at the time of the last treatment have failed to reveal any cancer cells.

### Genital Tuberculosis in the Male.

T. E. HAMMOND (*The British Journal of Urology*, June, 1941) discusses the pathogenesis, pathology and treatment of male genital tuberculosis. The chief thesis of this article is that the lesions met so commonly in the epididymis and body of the testis, as well as those in the *ductus deferens*, seminal vesicles and prostate, must not be attacked surgically as soon as they are diagnosed, for they may not be tuberculous, and even if they are, resistance to this organism must be established before operative procedures are attempted. Before such resistance is established by sanatorium treatment, any operation or even the passage of a cysto-

scope may cause the disease to break out in some other part of the body or may even lead to early death from an outbreak of acute miliary tuberculosis. Problems of pathogenesis are not easy of solution; yet it is known that removal of a tuberculous epididymis is often followed by great improvement in lesions situated in the prostate and vesicles. This supports the theory that the bacilli are first deposited from the blood stream in some part of the epididymis, and that luminal transmission in the direction of the seminal stream accounts for development of tuberculosis in the deeper genital organs. Another school, however, supports the idea of primary deposition in the prostate with infection of the posterior part of the urethra, and then transmission of bacilli to the epididymis by urethro-deferential reflux. It is possible that both mechanisms may act, and even in the same patient. Examination of the posterior part of the urethra by the cystoscope may be tempting, but must be avoided, for acute miliary tuberculosis may be set up. If associated urinary tuberculosis is suspected, diagnosis is best restricted to excretion urography until some degree of resistance is established and the genital lesions are removed or have improved. The present practice of the author in suspected genital lesions is to persuade the patient to take a month's restful holiday in fresh air, with a well-fitting support to keep the scrotum quiet. If the nodules are not consistently improved by this means the patient should be informed that he is a tuberculous subject, and the general nature of the disease should be explained to him. Sanatorium treatment, with section of the vas to prevent passage of bacilli and semen into the vesicle and prostate, is established. New tuberculin is injected every five days, commencing with one ten-thousandth of a milligramme, and the dose is slowly increased. The maximum dose is one one-thousandth of a milligramme. These injections should be continued for a year after the patient has left the sanatorium. Gold salts are good if there has been much proliferation of tissue, the initial dose being 0.01 milligramme, with slow increases. If the epididymal lesion shows no sign of decreasing at the end of three months, or if sinuses heal and then break down, the testis and epididymis with the *ductus deferens* up as far as the external ring should be removed. The seminal vesicle need not be removed unless it remains enlarged after the above operation and further sanatorium treatment; the operation will only very rarely be required. With prostatic disease there is a tendency to narrowing of the prostatic urethra, which may respond to careful dilatation. If a bar obstruction forms, endoscopic resection may be performed.

### Surgery of the Inferior Vena Cava.

J. HYMAN AND H. E. LEITER (*The Journal of Urology*, June, 1941) point out that experimental and surgical procedures have proved that ligation of the inferior vena cava below the renal veins is compatible with life. Eleven operative procedures on the vena cava are described—four accidental and seven deliberate. There were three operative deaths. In cases of right renal neoplasms the renal vein and vena cava should always be explored. In some of the reported cases patients have survived more than three years after removal of thrombi from the vena cava.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on August 28, 1941, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney. Dr. WILFRED VICKERS, the President, in the chair.

#### War Neurosis.

LIEUTENANT-COLONEL W. S. DAWSON read a paper entitled "The Prevention of War Neuroses" (see page 375).

Dr. J. A. H. McGEORGE said that Lieutenant-Colonel Dawson's paper had left little to be said. In Dr. McGeorge's own experience with regard to psychiatric boards, he had found that the largest percentage during training of those coming for consideration were mental defectives and epileptics. He had often thought it a pity to put epileptics out of the army; epileptics had a highly aggressive temperament, and might possibly make good "shock troops", if they could be suitably controlled. The mental defective was quite hopeless except in the most limited capacity. Amongst the conditions from which those returning from active service abroad were suffering was the anxiety state, the cause being given as exposure to bombing. Dr. McGeorge said that a large element of fear was present, and there was a conflict between the instinct of self-preservation and the dictates of duty. This gave rise to a state of mental turmoil, which brought about a train of anxiety symptoms, such as palpitation, tremor, insomnia *et cetera*. When the causative factor was not exposure to bombing, but long exposure to arduous conditions, the result was neurasthenia. What was needed were longer rest periods and better facilities for recreation. An important factor in the production of such conditions was separation from families. It was now suggested that soldiers, after twelve months' service, might be allowed to go home on leave. Dr. McGeorge thought this an admirable suggestion, which might overcome the tendency to neurasthenia in many instances. In discussing their prevention, Dr. McGeorge said that war neuroses fell into two groups: (i) those affecting the civilian population and (ii) those affecting soldiers. The civilian was exposed to the same risks as the soldier, and in addition another important element was at work—passivity. The civilian could not retaliate. Civilians should be given some "A.R.P." work. It had been said that if all the members of the community could be put into uniform, the situation would be saved. Such a course of action would be ridiculous; but there were many things that civilians could do, such as helping police, firemen and wardens, and organizing themselves into concert parties to cheer up those in the shelters. People living under shelter conditions night after night would be likely to suffer from exhaustion in the same way as the soldier. The same idea applied to the soldier, except that he was already part of an organization and could retaliate. Furthermore, by virtue of his physical training, he was less likely to suffer extremes of terror such as those induced in the civilian population by whistling bombs and similar devices employed in the "war of nerves". With regard to the soldier, it was important to eliminate the misfit. The scheme suggested by Lieutenant-Colonel Dawson was admirable, and if put into operation, as the committee hoped it would be, it should be successful in eliminating quite a number of unsuitable recruits. It was most disheartening to find the same smiling man coming up before the board time and again, not even having bothered to change his name. Dr. McGeorge thought it would be a good plan if a "black list" could be prepared and posted in the various recruiting centres, so that these people could be known and the examining officer could see whether these men had been found unfit for service before. In conclusion, Dr. McGeorge said that these were the main points to which he wished to direct attention from the psychiatrist's point of view, and if they were put into practice a popular description of the psychiatrist would no longer apply: "A psychiatrist is a person who dives deeper, stays down longer and brings up more dirt than anyone else."

Dr. LYLE BUCHANAN said that he had been interested in the list of suggestions compiled by the committee, and if practical effect was given to them, and if the list was circulated amongst Army Medical Corps officers, it would do much to eliminate the unfit. The most suitable time to eliminate them was on enlistment. He admitted that that would cause a certain amount of trouble, but at least 5% of the eliminated recruits were mentally unfit. One suggestion that he wished to make, that had not been brought up, was that mental unfitness was largely a matter of

heredity and family. If the recruit had to answer such a simple question as whether he or any of his close relatives had ever needed hospital treatment for nervous disorders, the information so gained, in conjunction with the result of the psychological tests, would enable the examining medical officer to refer any recruit of whom he had suspicions to a competent psychiatrist. Such a course of action would save time and money.

Before leaving the consideration of the soldier, Dr. Buchanan said that there was one point to which he wished particularly to refer: lack of sleep was a common cause, often a major cause, of nervous and mental breakdowns. In civil life about 5% of the population was taking bromide, and yet in Dr. Buchanan's memory of the last war he doubted whether he ever prescribed bromide. Abundant and quick sleep was very important in the prevention of neurosis. The soldier who had difficulty in going to sleep at night might be encouraged to go for his dose of bromide. Dr. Buchanan further said that the soldiers and officers who were aged over forty years were being eliminated; and yet the chief factor in making the older man unfit for active service was that he did not sleep soundly and roused quickly; the free use of simple sedatives might increase his efficiency.

In civil life it was fear and ignorance that caused panic and deterioration of morale. Knowledge of what to do had a great effect in preventing their occurrence. The thorough training of every unit of the civil population in "A.R.P." measures, with actual and realistic practices at war emergencies, in which every person from the adolescent on-wards had an active part, would go far towards the elimination of the strain attendant on an actual raid. Dr. Buchanan did not advocate the training of young children; he said that they did better to carry on as usual, being guided by their elders. When people were so trained, their reaction time was quicker and they knew what to do. Lieutenant-Colonel Dawson's maxim, "a job for everybody and everybody to a job", was excellent. Every member of the community should be allotted something for which he was absolutely responsible, and know that the rest depended upon his efficient carrying out of his task. Familiarity in advance with his actual war task would eliminate a great deal of nerve strain in the civilian just as it did with the soldier.

It was important also that the people should be able to trust their leaders, and therefore accurate and sufficient war bulletins should be supplied. It was not necessary to give strategic information, but the bulletins should be drawn up by trained journalists, so that the whole population would feel that it was in close touch with the men overseas. Another point that had not been stressed in relation to the civilian was the question of holidays. Anyone who was under considerable nerve strain needed two holidays a year, of not less than ten days each. It took seven days for the worker to free himself from his usual rut of thinking, and the remaining three days did him a great deal of good. During war people actually engaged in essential war work should have two holidays a year. The workers would make up for the time lost in efficiency and in ability to stand longer hours, and production would be increased, not lessened. Improved facilities for travel to nearby holiday resorts should be looked upon not as detracting from the war effort, but as increasing it. Dr. Buchanan also advocated the extension of travel concessions to relatives of soldiers abroad on active service. He said that such people were under a much greater strain than the rest of the population. Such a concession would be gratefully accepted by the community as a tribute to its fighting men and would result in greatly increased efficiency of the relatives. The point had been stressed in connexion with soldiers, for whom rest periods were advocated out of the firing line and out of the fighting zone.

Another point to which Dr. Buchanan referred was the fact that the vote for hospitals had been reduced in Australia. He deplored such a course, and thought that the vote should have been increased. He considered that in view of the possibility of raids the present hospitals would be in no position to cope with thousands of casualties. Moreover, in the event of Australia's actually becoming a theatre of war, it would be a great help to many workers who had illness in their homes to be able to leave the patients in safety in some hospital, rather than to have the added strain of caring for them at home. An increase in hospital accommodation should be regarded as a war measure.

Dr. CLIFFORD HENRY said that he felt that they all owed a debt of gratitude to Lieutenant-Colonel Dawson for the interesting and valuable paper he had just read. During the war of 1914-1918 no attempt had been made to prevent mentally unstable men from going overseas, and this had resulted in an annual pension bill of five million pounds being paid to ex-soldiers whose mental condition had been considered as due to war service, but a large proportion of whom would never have been sent overseas had supervision over enlistments been possible at the time of enlistment.



It was disturbing to realize that after two years of war psychiatrists were now just beginning to be consulted on such urgent matters. As an illustration, some attendants from mental hospitals visiting military camps had recognized ex-patients among the troops. It had been suggested that the army authorities should communicate with mental hospital officials, asking them to notify the authorities if it came to their knowledge in any way that ex-patients had enlisted.

DR. OLIVER LATHAM said that there was one point on which he joined issue with the previous speakers, and that was the question of heredity in the case of recruits "boarded" on account of mental or nervous instability. Dr. Latham pointed out that some of Britain's greatest soldiers and sailors had very illuminating family histories. Dr. Latham was reminded of his impressions when he examined psychotic soldiers on the ship bringing home the last of these patients from the war of 1914-1918. Placed together, they seemed rather obviously an unbalanced crowd; yet as recruits no doubt most had appeared normal enough and might not have broken down in civil life. Having broken down, they looked typical "hospitalized schizophrenics". He considered that it would be very hard to detect patients suffering from *dementia præcox* who had been well able to carry out their duties in civil life. The most sensible suggestion that had been made as to treatment was that the same set of medical officers should be associated with the training of a group of men, and so should be able to see how they reacted to the stiff training period. There would always be men who were born to be soldiers, although it appeared from their reactions that they ought to be rejected. Dr. Latham remembered one young man of very bad stock, with many relatives in mental hospitals. While he was on active service he was sent for treatment three times, and each time he was carefully cured and taken back, he was such a satisfactory soldier. This was in the British Expeditionary Force, and represented a good example of the practice of treating mental lapses as curable. In practice a number of obviously mentally deficient recruits came for examination and should be dismissed at once. A stiff period of training before embarkation would disclose a number of peculiar types who would be judged on their merits. Mental tests often helped to elucidate these further and helped the final decision. It was necessary to remember the voluntary basis of the Australian Imperial Force and the amount of responsibility often required of its soldiers. In the conscripted armies of older civilizations there seemed to be more concern that no one should miss his military obligations.

DR. L. A. LANGLEY said that he had been struck by one remark made by Lieutenant-Colonel Dawson, that the prevailing sympathetic attitude towards mental illness should be replaced by a sterner attitude; in other words, it appeared that some element of disgrace should attach to a discharge from the army on such grounds. But from the medical point of view that would be a retrograde step. For many years psychiatrists had been trying to persuade the public that there was no disgrace attached to mental illness. There were two groups of subjects to be considered: (i) the mentally deficient and (ii) the emotionally unstable. The members of the first group were not responsible for their condition and could not be blamed for it; they were in the same plight as a man afflicted with some form of congenital heart disease, to which no disgrace attached. In the second group there might in certain cases be an element of moral weakness, the mental illness being a flight, a means of escape; but here the mechanism was largely unconscious. As far as the group of straight-out psychotics was concerned, one wondered why an element of disgrace was necessary; their condition was no fault of their own. The members of the public were only just beginning to develop a more modern and progressive attitude to mental illnesses, and to agree more readily to the admission of their mentally ill relatives to proper hospitals and institutions. If some element of disgrace was to be applied to psychotics discharged from the army, it was going to be much more difficult to treat the civil population.

DR. CEDRIC SWANTON said that the Advisory Committee had decided that such catch phrases as "shell shock", "bomb shock", "D.A.H.", "effort syndrome" and "war neurosis" should have no place in our terminology. Consequently it seemed a pity that the title of the present discussion should be "The Prevention of War Neurosis" rather than "The Prevention of Neurosis in War". Dr. Swanton said that the obvious reason for this was an attempt to prevent the production of compensation neurosis, and that this was a matter of paramount importance.

Every soldier returned to Australia with a neurosis was a potential compensation neurotic. The importance of this lay in the fact that the Repatriation Department had not yet defined their position as to whether the neuroses were compensable or not. Dr. Swanton thought that as these men were already returning, immediate and special steps should

be taken for their rehabilitation into industry, as only in this way could an attempt be made to guard against the licensed emotional instabilities still in existence after the last war.

DR. C. A. HOGG said that he had listened with pleasure to Lieutenant-Colonel Dawson's paper. It was difficult for one who had not been in the midst of the bombings, and therefore had to judge from a distance, to realize the direct effect on soldiers. However, he understood that during the last war, which was not so mobile as the present one, it was of the greatest advantage for the medical officers close behind the lines to deal with the milder cases of anxiety neurosis as quickly as possible; by that means a greater number of soldiers were returned to the ranks. Once they drifted back into the base hospitals, where the psychiatric staff was located, it was difficult to get them back to active service again. With progress to the rear, fewer went back into the lines. To improve this state of affairs, the British Government instituted a system of training for medical officers in elementary psychiatry, sufficient to enable them to deal with mild cases as close behind the front lines as possible. Dr. Hogg thought that the British system might well be carried out.

LIEUTENANT-COLONEL C. PARKINSON thanked Lieutenant-Colonel Dawson for his comprehensive survey of the subject. Colonel Parkinson said that he had not intended to take any part in the discussion, because he felt that he had had no particular experience of the conditions under discussion. His experience had been concerned with the aftermath of these things. Some of the later speakers had mentioned various things which had caused him to think that he might touch on one or two points. The first was the non-occurrence of neurotic conditions amongst the civilian population in England; this was well worthy of publication. A typical example was that provided by a man employed on the door of one of London's hospitals, which was severely damaged by bombing; the man returned to his duties after the seventh day and had remained there ever since. Lieutenant-Colonel Parkinson said that he had had to deal with the compensation side of the matter, and he considered that subject one of tremendous importance. At the present time the compensation bill for Australia was something less than £10,000,000 per annum, and certainly more than half of that sum was paid out for neurotic disablement—the neurotic condition that occurred when a man was compensated for invalidity of whatever kind. The figures were colossal. Apart from the money, the idea of the human waste and unhappiness that such a figure represented was appalling, and Colonel Parkinson felt that something must be done to prevent a similar thing from occurring after the present war. A small pamphlet had been issued by the Ministry of Pensions during the last war and distributed to every medical man in the United Kingdom at the beginning of the present war; this was one of the factors operating now and influencing the members of the medical profession. Lieutenant-Colonel Parkinson considered that the pamphlet should be put into the hands of every medical practitioner in Australia. It had already been given to army medical officers, but it should be reprinted and generally distributed.

SIR CHARLES BLACKBURN said that he had been interested in Lieutenant-Colonel Dawson's paper and in the discussion, and that there was food for thought in much that had been said. The problem was one of extraordinary difficulty. One speaker had said that medical men must not let it be thought that it was a slur to be removed from the army because of a neurosis. That was quite true; yet there was a certain amount of *esprit de corps* that should be encouraged, and that made a man not want to leave the army if he was only mildly neurotic. The condition of such men often improved marvellously, and that was an aspect of the question that had to be taken into account. It must not be made too easy to leave the army. For that reason Sir Charles Blackburn disagreed with one suggestion made by Lieutenant-Colonel Dawson, that the list of abnormalities he had quoted might be put into the hands of company commanders and senior non-commissioned officers. There were many men in the army who became "a bit fed up", but they were not particularly neurotic. The list quoted by Lieutenant-Colonel Dawson should be kept for medical officers, otherwise quite possibly regimental medical officers might not be able to find out those genuinely suffering from a neurosis, because so many others would have the knowledge necessary to enable them to produce the symptoms. During the previous war men went down with an apparent war neurosis, and a little difficulty was experienced with them in hospital; but when they realized that their "game was up" they gave in and went back to the front quite cheerfully. There were quite a number of men who, having grown a little tired of training, would be glad to know of an easy way to get out of the army. There were also men who were mildly neurotic, but who, if treated in the right

way made very good soldiers. Sir Charles Blackburn approved of the remarks made by Lieutenant-Colonel Dawson concerning regimental medical officers. During the last war it was noticeable that some regimental medical officers rarely had men sent down owing to illness, and others always had men off duty. It was a question of knowing how to deal with men; in the case of the successful officer, the men would feel able to go to him with minor difficulties, and he put them right. It would be an excellent thing if regimental medical officers had a little more training, not particularly with regard to psychoses, but more with regard to early neuroses; many of the men so affected could be saved.

DR. WILFRED VICKERS, from the chair, said that those present were much indebted to Lieutenant-Colonel Dawson for his paper, and also to Major-General Maguire for bringing into being the Advisory Committee, for recognizing the importance of the subject and for appointing medical practitioners to go abroad and carry on the work on the other side. Dr. Vickers thought that the measures taken would probably result in the occurrence of fewer cases such as those mentioned by Lieutenant-Colonel Parkinson. There were two ways of looking at the question of "boarding": the points of view of the "boarding in" and the "boarding out" medical officers. When a man was eager to go away, he hid everything; but when he wanted to leave the army he was only too ready to give a full and complete history. Another point was that a long time was spent in training, and many men felt that they were not going to get away; this caused them to want to go back to their ordinary work. If they were allowed to do so one at a time, a rot would set in. It was probably better to make a mistake and send away a few unsuitable men than to free a number who were required. Undoubtedly the regimental medical officer who knew his men individually and their officers, from their commanding officers right down to platoon commanders, could do a tremendous amount. Sir Charles Blackburn had said that it was quite obvious who were efficient medical officers from the small number of men sent down from their units. If the regimental medical officer kept the men on the right track, he was one of the greatest influences and one of the greatest helps that the platoon commander had. With regard to civilians, Dr. Vickers said that a number of Newcastle medical practitioners had noticed strain amongst workers in that district; that was being to some extent dealt with. The Federal Minister for Labour, Mr. Holt, had arranged through the Institute of Almoners in Melbourne to give a six months' period of training in social work. There was no doubt that the scientifically trained social worker was better than the amateur.

Lieutenant-Colonel Dawson, in reply, thanked those present for the pertinent remarks made on the subject under discussion. Everybody appeared to be in agreement about the great importance of the regimental medical officer in the scheme. With regard to Sir Charles Blackburn's comments, Colonel Dawson said that he did not think it was intended that the list of directions should be handed to non-commissioned officers, but it was considered feasible that medical officers should tactfully address officers and possibly senior non-commissioned officers on the subject of morale and on the recognition of neurotic types. All along it was necessary to depend on the discretion of the regimental medical officer in these matters. The point raised by Dr. Langley was difficult. As he had suggested, the question of the attitude of medical men to neurotics in the military forces and in civilians did involve some change of front from that adopted in times of peace. The attitude had hardened in the Old Country; perhaps there was no need for the change, because the population was standing up to conditions extremely well. It simply was not done to escape into nervous illness. Colonel Dawson said that he was going overseas with an open mind, since experience might lead him to change his point of view. In reply to Dr. Buchanan, who had referred to the civil population and to the use of bromide, Colonel Dawson said that one might question the advisability of "doping" soldiers with sedative drugs, whether bromides or even alcohol, while in the front line; the effects might be inconvenient, if not disastrous. More should be done for the civil population; in England people did not really "get together" until the actual bombing started. Forewarned was forearmed, and they should be given training so that their morale would be better if danger threatened. In conclusion, Colonel Dawson thanked those who had joined in the discussion for the interest they had shown in the subject and for their helpful remarks.

A MEETING of the Queensland Branch of the British Medical Association was held on July 4, 1941, at British Medical Association House, Wickham Terrace, Brisbane, Dr. J. G. WAGNER, the President, in the chair.

### Psychiatry and Clinical Medicine.

DR. N. V. YOUNGMAN read a paper entitled "The Contribution of Psychiatry to Clinical Medicine" (see page 378).

DR. S. F. McDONALD said that he had listened with pleasure and interest to Dr. Youngman's paper. Dr. McDonald was not a psychologist, but since the last war he had been seeing a pitiful group of people in the Repatriation General Hospital, and he realized how lacking the psychiatric treatment was, both for hospital and for private patients. Dr. Youngman's paper could be divided into three parts: (i) the organization of the actual hospital, (ii) the teaching given to the medical profession, and (iii) the various forms of treatment to be carried out. The first was unlikely ever to be seen in Brisbane; such a large staff, and such a highly paid one, seemed possible only in the United States of America. One had only to realize the struggle of psychiatrists in Australia to get things done to see the small importance attached by the Government to this form of treatment. In the mental hospitals were confined those people who might be very dangerous; but by that time they had gone a long way in need of treatment. The time to treat these people was in the general hospitals, or when they were private patients. Dr. McDonald wondered whether a clinic could be organized at the Brisbane General Hospital. Treatment could be carried on to let these people know that they were invalids and not dangerous and someone to be ashamed of; they had this feeling, and it was the difficulty of eliminating it that made their improvement slow. Dr. McDonald considered that it would be difficult to induce these patients to go to see a specialist if the door through which they entered was labelled, as they would consider that some stigma attached to such treatment. He thought the solution lay with the education of the ordinary medical practitioner, who was probably more densely ignorant on the subject of general neurology and psychology than on any other medical subject. It was easy treatment to remove septic foci and make the patient better for a short time; but these unfortunate people were often reduced to neurotics by frequent operations. The same happened with war gas patients, who generally had no after-effects except neurosis, the condition being due to gas hysteria. In the treatment of these patients the most important thing was to let the patient talk and to study his personality. The medical profession needed to be taught to study these people, as frequently, from their story, one could make a diagnosis before even examining the patient. The important point was to recognize the type early and prevent harm being done. Dr. McDonald agreed with Dr. Youngman that there was a large number of persons with bad psychoses, to whom the use of shock therapy had given hope never dreamed of before. A number of people with minor psychiatric ailments could be helped by the general practitioner without shock therapy. Dr. McDonald did not agree with Dr. Youngman that these people should go to hospital; he thought they needed to be given time and to be made to realize that they were important, and this could best be done by the general practitioner at home. The crowded out-patient department, whether medical, surgical or psychological, was generally the worst place for these patients.

DR. E. S. MEYERS congratulated Dr. Youngman on his interesting paper. Dr. Meyers had been waiting many years to hear such a paper, and he thought that it should do much good. The subject of psychiatry was the Cinderella of medical sciences and had to be put in its proper place. The Rockefeller Foundation in the United States of America thought so highly of it that nearly all their grants were being spent in putting it in its right place in the medical curriculum. THE MEDICAL JOURNAL OF AUSTRALIA had lately published a series of articles on mental states; but the most important one had not yet been written, as there had been no article which dealt with the way the subject should be taught. One of the first questions was that of providing suitable hospital accommodation and occupational therapy. One would have to have a different outlook on the building of the hospital; if a large model hospital were to be constructed, why not put it at Saint Lucia, at the new university, where there was room for games and occupational therapy? The next question was the teaching of the subject, and Dr. McDonald had touched on this. Much of the psychiatric examination of the patient was in the nature of the confessional, and only the patient and the doctor could be present. Dr. Meyers agreed with Dr. McDonald that the great majority of patients should be seen in the private home. The grandfathers of the present medical men had got on well with minor cases, having plenty of time to spare for the patients; there was not then the fashion for the numerous "ectomies". How did Dr. Youngman intend to train the students in this subject? Would gramophone records be possible? Dr. Meyers was convinced that one could not use ordinary methods. He

agreed with Dr. McDonald about specialists, and in fact he had had a patient referred to him by another surgeon specialist. If these patients with minor psychiatric disorders were all to be turned over to the psychiatrist, he would be "snowed under". Dr. Meyers did not think that all teachers in Brisbane were missing the psychiatric side altogether; he tried himself to use psychiatric methods a little, but he thought all these patients should go back to the general practitioner, who should have time to attend to these things. Dr. Meyers hoped that Dr. Youngman was going to make his presence felt and try to improve matters and not just read papers.

Dr. L. J. JARVIS NYE thanked Dr. Youngman for his interesting paper. He said that Dr. Youngman had made it clear that a good medical practitioner should also be a good psychiatrist. Dr. Nye thought that "quacks" who traded on the public's fears should be tracked down and eliminated, and also that there should be more supervision of the advertisements for patent medicines, which must make people "disease-conscious". The medical profession should also eliminate its own "quacks"; there should be either compulsory study groups or post-graduate courses to keep everyone in touch with all subjects. With regard to "Cardiazol", Dr. Nye said that there were several points he wished to stress with regard to fractures and the possibility of legal action. He considered that it was necessary to inform the responsible relatives that there were risks of trauma; but this was not sufficient; they should be asked to sign a statement that they understood this responsibility. In addition, it was necessary to have skilled attendants during the convulsive seizure. Another question was whether it would be wise to examine some bones radiologically, to be sure that there was no absorption of calcium, as occurred in some patients who had been in bed for some time, and also in thyrotoxicosis *et cetera*.

Dr. W. H. STEEL said that he had been doing a considerable amount of this work during the last ten years; 75% of the work had so much neurosis in it that it represented the greater part. Dr. Steel instanced the case of a patient complaining of a pain in the stomach; the medical practitioner decided that the pain was due to a neurosis, but, "just in case it was not", gave the patient a mixture (three bottles to be taken). Dr. Steel thought that the profession should take its courage in both hands, even if members occasionally called the condition a neurosis when it was organic. He thought the senior members were worse than the juniors. Frequently an X-ray examination was made, other tests were carried out, and about £15 was spent in deciding that the condition was really a neurosis. This could be done with hospital patients but not with private patients. Dr. Steel instanced soldiers with nervous tachycardia, who could not be sent by the regimental medical officer to a specialist for an electrocardiogram. The profession should mix more courage with the advice given to patients. Dr. Steel said that he had always had the feeling that the headache following a fractured skull was a neurosis because the patient was kept too long lying down. Was it wise to allow the patient up when he felt he wanted to get up? Dr. Steel asked for Dr. Youngman's opinion on the point.

Dr. Meyers spoke again. He said that there were two points in Dr. Steel's remarks that he wished to emphasize: (i) Dr. Steel's patients were all of the soldier class. (ii) At the end of the last war psychiatric methods were being used with success, and a large number of people were cured because the practitioners had the courage to tell the truth. Dr. Meyers thought Dr. Steel's institution was not up to date by a long way in so far as psychiatry was concerned.

Dr. J. G. WAGNER, from the chair, said that he wished to take up the cudgels with some of the previous speakers on behalf of the general practitioner. He considered that the general practitioner standard in Queensland was remarkably high. Dr. Wagner said that if a poorly paid panel service came into being it would not be conducive to a good psychiatric or even a good physical standard. He hoped that Dr. Youngman, as one of the younger practitioners, would endeavour to have something done to improve matters a little.

Dr. Youngman, in reply, stressed the fact that his plea was not for more psychiatrists, but for a wider recognition of psychological factors in the teaching and practice of medicine. The teaching should be on the broad lines indicated and closely associated with a general hospital. He also did not wish to imply that all these patients should be treated in hospital; they should be treated by their own doctors, who could have available such hospital facilities as occupational therapy *et cetera*. The treatment of head injuries was an individual problem, depending on the psychological make-up of the patient and the severity of the injury. A careful assessment of these factors rather than an arbitrary period should determine the time spent in bed.

## Correspondence.

### ON THE NATURE OF ECLAMPSIA.

SIR: Dr. W. J. Penfold's observations (August 23, 1941) upon the nature of eclampsia will not unnaturally be studied with attention by those who are interested in the mystery of the causation of this disturbance. Dr. Penfold states that in eclampsia no glycogen is to be found in the liver, and he adduces this fact in support of his contention that eclampsia consists primarily of damaged liver function whereby lactic acid can no longer be converted to glycogen. The accumulation of lactic acid in the body, he argues, would then bring on the symptoms characteristic of eclampsia.

The exhaustion of liver glycogen, together with the excess of lactic acid in the blood, appears to me, however, to be the normal result of the excessive muscular contractions during the eclamptic fit. Samson Wright ("Applied Physiology", 1936) states that no glycogen is to be found in the liver of a fasting animal after strychnine convulsions; and he states further that after violent exercise the concentration of lactate in the blood may rise as high as 200 milligrammes per 100 cubic centimetres (more than ten times the normal level).

It would appear, therefore, that Dr. Penfold has confused cause and effect, and that we are no nearer than heretofore to the discovery of the cause of the eclamptic convulsion.

Dr. Penfold has brought forward no evidence in favour of his theory of infection as a cause of eclampsia, and in consequence his recommendations for its prevention, based upon the bacterio-metabolic theory, will lose a good deal of their authority.

Regarding the treatment of eclampsia, the results of the intravenous injection of alkalis will be awaited with interest. The time-honoured "eliminative" treatment has little to recommend it. It is based upon a theory of intestinal toxæmia which has no scientific foundation. In spite of this (so potent is the weight of authority in medicine), nearly all eclamptics continue to have their bowels and stomachs washed out, whereas non-parturient sufferers from uræmia due to nephritis, with similar symptoms, rarely have alimentary lavage applied to them.

Large doses of sedatives would appear still to be our most important standby. The recent observations of Youngman (THE MEDICAL JOURNAL OF AUSTRALIA, August 30, 1941), however, seem to suggest that heavy doses of barbiturates would be more effective than morphine. In his experiments barbiturates were capable of warding off "Cardiazol" convulsions in guinea-pigs, whereas morphine appeared to have little effect.

Yours, etc.,

M. KELLY,  
Captain, Australian Army  
Medical Corps.

7, View Street,  
Peppermint Grove,  
Western Australia.  
September 14, 1941.

### REFUGEE DOCTORS.

SIR: I have just completed a 940-mile journey in Victoria and visited fourteen bush nursing hospitals, three bush nursing centres and five ambulances.

Three hospitals are closed for want of doctors, three more were closed before the war for the same reason, some are carrying on without doctors or by obtaining doctors from a distance where such is possible.

Any statement that there is no shortage in the country is unfounded. In the city of Horsham three doctors are, or were, caring for 13,000 people.

No responsible person with whom I am acquainted has asked for general registration of alien doctors, as they would, like our own Australians, mostly make for the city, and that would be grossly unfair to those serving overseas. But the country asks for registration for specified places, where the medical conditions are almost barbaric, and for the duration of the war.

Furthermore, of the fourteen aliens possible for the country, some are Poles or Czechs, whose nationals are fighting with us by land, sea and air. Some completed their course in Italy, but are not Italians. One Czech is employed by the Government as a first-aid officer, whilst a hospital is asking for him. One successful practitioner, not one of the fourteen, is at work but not registered.

There are normally 1,700 practitioners in Victoria. The fourteen aliens available for the country do not warrant the complaint made of taking away the work of our own



men. They are wanted only in country places where there is, and has been for a considerable time, no doctor available. Let us be fair and use some common sense in approaching this problem.

Yours, etc.,

JAMES W. BARRETT.

103-105, Collins Street,  
Melbourne, C.I.  
September 20, 1941.

SIR: Dr. Lipscomb's views are not universally held, and one of them especially points the way of future trouble in the organization of the British Medical Association.

We are told that foreign degrees are not as good as Australian and that foreign doctors should not be registered because of their inferiority as regards knowledge of medical science.

This view was advanced by a medical board in a law case and the presiding judge ruled it out. He said among other things that our best men go abroad to learn from Continental universities. While it must be admitted that some foreigners do not possess the qualifications to practise as general practitioners, they could be tested by asking them to pass the examinations in the final year—to see if they really do or do not possess the necessary mental equipment for general practice. This is where Dr. Lipscomb's objection as to language would be met. When one lives in a country for a short while, it does not take much time to learn the language.

It is just simply absurd to say that foreign degrees, such as M.D., Berlin, Vienna or Paris, are not good enough here or that the best pathologist in the Vienna General Hospital of 3,000 beds, who had paid visits to the United States of America as guest lecturer to the American Medical Association, and is now at the Cook County Hospital in the United States of America—speaking perfect English—should be debarred from practising here. This is an actual case.

Is there one nose and throat specialist who has not studied or would not have given years of his life to have studied under Professor Neumann, of Vienna? Yet his first assistant would have come here if the laws had permitted.

Therefore it is hard to convince people that all foreign degrees should be taboo.

Dr. Lipscomb states that without doubt, though opposed to the Nazi régime, foreigners are German nationals at heart and therefore anti-British.

So far from this idea being axiomatic, it is again open to serious question. It may be true in some of the cases that Dr. Lipscomb has met, but he has fallen into the error against which the British Prime Minister has warned us. He solemnly declares that Nazi Germany is the German people and that they cannot be divorced from the policy of their rulers. We have been urged again and again to recognize that we are at war with the German nation and not Hitler, Goering and Goebels. The Germans are 100% behind their leaders.

The Germans here have been dispossessed of their belongings, their livings and their rights as citizens. Many have suffered the tortures of the concentration camp and Gestapo. They have been branded as foreigners in their native land and treated as outcasts—by the German people.

It is inconceivable that all of them are German nationals at heart. I do not believe that one of them whom I have met who has forbidden his children to speak German in their home here, is a national of any country but this.

Isn't it still good doctrine to give a stranger a haven within our gates? Hitler fired his poisoned arrows in 1933, and it seems a pity to find that some of them have reached this fair country. The philosophy of Europe is no good to Australia.

Dr. Lipscomb is on safer ground when he states that the medical men abroad will resent the admission of foreigners to practise on patients formerly their own, and it is on this point that I would introduce something quite relevant to the point of his theme.

The rehabilitation of the doctor abroad is one of grave concern to the British Medical Association. It is inevitable that the medical officer on his return will find that his place has been filled by those who stayed at home. There will be hospital appointments, seniority rights and appointments to public bodies to be returned to him. Leading surgeons and physicians will have lost clientèle, and general practice completely rearranged, especially where the population is always on the move.

This was the experience of the last war. So disgruntled were the returned medical officers that they formed a Returned Medical Officers' Association and ran a ticket for the council of the British Medical Association, ousting several men who had worked hard to make things better for them on their return.

The problem will be complicated by the presence of several medical bodies instead of one, and I would urge as a preliminary move the amalgamation of all of them—now—to make the path of the returned medical officer an easy one.

Yours, etc.,

D. ROSEBY.

Richmond,  
Victoria,  
September 23, 1941.

#### A NATIONAL MEDICAL SERVICE.

SIR: The letter of Dr. Maude in your issue of 20th instant has received much publicity from sensational newspapers and broadcasting stations.

No doubt some form of national medicine will some day come about, but it must be a complete service and embrace the specialist as well as the general practitioner.

The latter would and should resolutely refuse to become a crowd of "bell-hops" for their specialist friends.

Again, in a nationalization scheme (as very much opposed to a scheme of national health insurance as in England) the question of hours and districts must be decided as well as remuneration. Where he derives no further benefit from it, it would be unreasonable to expect the general practitioner to be on duty twenty-four hours a day, seven days a week. Some "shift" arrangement would need to be developed and a central clinic established in each district. Once we become government employees we should not be required to provide our own offices by setting aside portion of our dwelling houses. Arrangements could be made on a "shift" system for attending refresher courses and keeping up to date.

No attention need be paid to the inevitable "free choice of doctor" cry which will be raised by a "shift" and zone system. It does not apply at public hospitals and can be safely neglected in a nationalization scheme. A system such as this could be much further elaborated and the general practitioner would have the comfort of knowing that he can get for his patient the assistance of a specialist without having to "count the cost".

Yours, etc.,

"JUST ONE G.P."

Sydney,  
September 22, 1941.

#### THE STUDENT AND THE CURRICULUM.

SIR: The leading article on students and the curriculum interests me profoundly. It is true that on entering a medical school the student enters a new life and is to an extent thrown on his own resources. It is also true that unless he exerts himself he will never learn as he should.

I lectured and examined in three medical schools in different parts of the world and long since realized that the discursive method gives far the best results. But at one time I had a class of 220 students. If divided into groups of twenty, eleven lecturers would have been required. The strength of Oxford which outweighs its weakness is the tutorial system.

I have been a member of, I think, eight committees appointed to revise the curriculum in Melbourne. In every case it was agreed that there was too much teaching, and yet every specialist present insisted that the student must learn more of his particular subject.

When the curriculum was increased from five to six years I hesitated to agree. I think with a good school education five years is sufficient, provided every graduate becomes an intern in a hospital for one year, as in North America. After all, the object of the curriculum is to produce capable scientific practitioners.

Years ago Herbert Spencer stated that a physician's business was to note departures from the physiological normal, and drew the retort from Huxley: "God forbid that I should ever fall into the hands of such a physician."

As Huxley stated, competent medical practitioners are required who must know the basic facts of anatomy and physiology in the way a man knows his own home and his native place. Knowledge of such a character that if wakened out of sleep he could answer correctly. That is my humble opinion of medical requirements which must be part of the mental make-up.

Yours, etc.,

JAMES W. BARRETT.

103-105, Collins Street,  
Melbourne, C.I.  
September 22, 1941.

INFLAMMATORY CONDITIONS OF THE MOUTH  
AND PHARYNX.

Sir: On the afternoon of July 17, 1941, I was asked to see Baby —, aged one year and eight months; complaint was swelling of throat, difficulty in opening mouth, profuse right otorrhoea, diagnosed as retropharyngeal abscess.

Under carefully administered inhalation anaesthesia one was enabled to diagnose a typical quinsy, which was opened in the "site of election" for quinsy, the only difficulty being caused by necessity of using an almost prone position of the little patient for safe evacuation of the pus, which was enormous in quantity and caused much expansion of the soft palate.

The condition was a quinsy; subsequent progress was satisfactory. I have also opened a quinsy in another child just over two years of age.

I fail to understand what logical reason, anatomical or otherwise, can be given for stating that "Quinsy was never seen in patients under ten years".

Yours, etc.,

ERNEST CULPIN.

Ballow Chambers,  
Wickham Terrace,  
Brisbane.  
September 23, 1941.

Sir: I have to thank Dr. Herbert Earnshaw for his courteous letter and accept without reservation his diagnosis of quinsy in a child of six years of age. I have long known the adage, and should have observed it on this occasion, that the two words "always" and "never" should be avoided when discussing the phenomena of disease.

Yours, etc.,

RAYMOND HENNESSY.

55, Collins Street,  
Melbourne, C.I.  
September 23, 1941.

## Naval, Military and Air Force.

## APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 187, of September 18, 1941.

## CITIZEN NAVAL FORCES OF THE COMMONWEALTH.

## Royal Australian Naval Reserve.

**Appointments.**—Graeme Alvin Robson, Ronald MacKenzie MacIntosh and Ronald George MacAlpine McKay are appointed Surgeon Lieutenants, dated 12th August, 1941, 14th August, 1941, and 18th August, 1941, respectively.

**Termination of Appointment.**—The appointment of David Blair Robertson as Surgeon Lieutenant is terminated, dated 12th August, 1941.

## AUSTRALIAN IMPERIAL FORCE.

## Australian Army Medical Corps.

**To be Lieutenant-Colonel.**—Major (Honorary Lieutenant-Colonel) H. C. Nott, 19th July, 1941.

**To be Major.**—Captain (Temporary Major) J. Kingsley, Captain S. W. Bryan, Captains (Temporary Majors) C. D. Donald, C. W. K. Hardy, A. L. Carrodus, J. M. Blair, I. H. Sender, C. R. Blomfield and F. D. Stephens, 19th July, 1941.

## Permanent Supernumerary List.

Captain J. Bates is transferred from the Australian Army Medical Corps, 18th July, 1941.—(Ex. Min. No. 166—Approved 17th September, 1941.)

## AUSTRALIAN MILITARY FORCES.

## AUSTRALIAN ARMY MEDICAL CORPS.

## Northern Command.

## First Military District.

**To be Major (temporarily).**—Captain (provisionally) Q189184 R. A. G. Malcolm, 18th August, 1941.

**To be Captain (provisionally).**—Alfred John Barnett, 25th March, 1941.

**To be Honorary Captain.**—John Bostock, 14th August, 1941.

## Eastern Command.

## Second Military District.

The following officers are appointed from the Reserve of Officers (A.A.M.C.) and to be Captains (provisionally) on the dates shown: Honorary Captains N79718 L. A. Moxham,

25th October, 1940; S. D. Allen, 4th August, 1941; F. M. C. Jones, 7th August, 1941; and L. J. A. Parr, 13th August, 1941.

The notification respecting the secondment of Captain W. Freeborn, which appeared in Executive Minute No. 134/1941, promulgated in *Commonwealth Gazette* No. 149 of 1941, is cancelled.

Captain (provisionally) D. C. C. Hinder is transferred from Australian Army Medical Corps, 3rd Military District, 31st July, 1941.

The following officers are transferred to the Reserve of Officers (A.A.M.C.): Captains (provisionally) H. I. McKenzie and A. E. Gatenby, 13th August, 1941.

The resignation of Captain J. N. Sevier of his commission is accepted, 2nd November, 1941.

Colonel R. W. W. Walsh, D.S.O., V.D., is seconded, 9th August, 1940, and to be Brigadier (temporarily) and remains seconded, 11th July, 1941.

**To be Captain (provisionally).**—Mervyn Harrie Elliot-Smith, 2nd June, 1941.

Lieutenant-Colonel A. C. T. Thomas is transferred from Australian Imperial Force, 5th September, 1941.

The notification respecting the appointment of Honorary Captain Keith Walker Locke, which appeared in Executive Minute No. 134/1941, promulgated in *Commonwealth Gazette* No. 149 of 1941, is amended to read "Honorary Captain Keith Morgan Locke".

The date of appointment of Honorary Captain N79718 L. A. Moxham, notification of which appeared in Executive Minute No. 232/1940, promulgated in *Commonwealth Gazette* No. 258 of 1940, is amended to read "25th October, 1940".

**To be Honorary Captains.**—Eric Alfred Tivey, 14th August, 1941, and Joseph Besnard Wilson, 18th August, 1941.

## Southern Command.

## Third Military District.

Captain (Honorary Major) S. O. Cowen is appointed from the Reserve of Officers (A.A.M.C.) and is seconded and to be Major (temporarily), 16th April, 1940, ceases to be seconded 31st July, 1941, and to be Lieutenant-Colonel (temporarily), 1st August, 1941.

Lieutenant-Colonel W. G. D. Upjohn, O.B.E., is appointed from the Reserve of Officers (A.A.M.C.), 1st August, 1941.

## ROYAL AUSTRALIAN AIR FORCE.

## Citizen Air Force: Medical Branch.

Valentine Neville Buchanan Willis, M.B., Ch.M., is appointed to a commission on probation with the rank of Temporary Squadron Leader, with effect from 1st August, 1941.

The following are appointed to commissions on probation with the rank of Flight Lieutenant, with effect from the date indicated: Alan Ambrose Murray, M.B., B.S.; and Michael Hugh Mulvihill Ryan, M.B., B.S., M.R.C.S., L.R.C.P., 12th August, 1941.

## Reserve: Medical Branch.

The following are appointed to commissions on probation with the rank of Flight Lieutenant, with effect from 1st August, 1941: Hillary Ray Penn Boucaut, L.R.C.P., M.R.C.S., Dudley John Lampard, M.B., B.S., Vernon Wheatley Potter, M.B., B.S.—(Ex. Min. No. 128—Approved 17th September, 1941.)

George Edmund Bevan is appointed to a commission on probation with the rank of Flight Lieutenant, with effect from 12th August, 1941.—(Ex. Min. No. 129—Approved 17th September, 1941.)

Australasian Medical Publishing  
Company, Limited.

## ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, New South Wales, on September 24, 1941. Dr. T. W. Lipscomb, the Chairman, in the chair.

## Directors' Report.

The report of the directors of the company was as follows:

The directors submit their report for the twelve months ended June 30, 1941, together with the profit and loss account for the twelve months ended June 30, 1941.

THE MEDICAL JOURNAL OF AUSTRALIA continues to maintain its standard and its popularity. A number of informative

articles in reference to the war activities of the medical profession has been published and every available opportunity has been taken to cooperate with the medical services of the Navy, Army and Air Force, and to further the nation's war effort. Paper rationing regulations have had the effect of reducing the number of pages during the year under review, but any reduction in reading matter was obviated to some extent by the use of smaller type.

After taking into consideration the effect of the paper rationing regulations on production, the output of the printing and publishing department must be regarded as satisfactory. The work produced was of the usual high quality, and the company is gaining a reputation as printers and publishers of books of an educational or scientific nature.

A war savings certificates group was commenced at The Printing House shortly after the outbreak of war, and the directors are pleased by the manner in which employees contribute to purchase certificates.

Depreciation amounting to £1,102 18s. 2d. was written off during the year, and an amount of £495 3s. 10d. has been provided for taxation. The company's reserves are used in the business, and we consider that the state of the company's affairs is satisfactory.

Provision has been made for the payment of debenture interest for the twelve months ended June 30, 1941.

Dr. D. Gifford Croll and Dr. T. W. Lipscomb retire from office by rotation in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

T. W. LIPSCOMB,

Chairman.

August 12, 1941.

#### Election of Directors.

Dr. D. Gifford Croll and Dr. T. W. Lipscomb were reelected to the Board of Directors.

#### MEDICAL WAR RELIEF FUND.

THE following is an eighteenth list of contributions to the Medical War Relief Fund established by the Federal Council of the British Medical Association in Australia for the relief of distressed medical practitioners in Great Britain.

##### Western Australia.

£1 1s.: Dr. J. McAuliffe.

#### Obituary.

##### ALBERT REGINALD MCLEOD.

We regret to announce the death of Dr. Albert Reginald McLeod, which occurred on September 21, 1941, at Sydney, New South Wales.

#### Australian Medical Board Proceedings.

##### QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Act, 1939*, of Queensland, as duly qualified medical practitioners:

Hynes, James Vincent, M.B., B.S., 1941 (Univ. Queensland), General Hospital, Brisbane.

MacLurkin, Alfred Robert, M.B., Ch.B., 1900 (Univ. Glasgow), Cooktown.

Reeves, Thomas Conrad, M.R.C.S. (England), L.R.C.P. (London), 1911, Quay Street, Bundaberg.

#### Medical Appointments.

Sir Charles Bickerton Blackburn, Professor Hugh Kingsley Ward and Dr. Thomas Walter Lipscomb have been appointed directors of the Prince Henry Hospital, in pursuance of the *Prince Henry Hospital Act, 1936*, of New South Wales.

Dr. Clive Lansdell Paine has been appointed a Medical Referee, in pursuance of the provisions of *The Workers' Compensation Act, 1916 to 1939*, of Queensland.

Dr. Garnet Andrew Ross has been appointed Medical Superintendent, Department of Public Health of New South Wales.

#### Books Received.

"Starling's Principles of Human Physiology", edited by C. L. Evans, D.Sc., F.R.C.P., F.R.S., LL.D., with chapters on the Special Senses revised by H. Hartridge, M.A., M.D., Sc.D., F.R.S.; Eighth Edition; 1941. London: J. and A. Churchill Limited. Royal 8vo, pp. 1,257, with 673 illustrations, 7 in colour. Price: 32s. net.

"Food Values in War-Time", by V. G. Plimmer; 1941. London: Longmans, Green and Company, Limited. Crown 8vo, pp. 30. Price: 1s. net.

#### Diary for the Month.

OCT. 7.—New South Wales Branch, B.M.A.: Council (Quarterly).

OCT. 10.—Queensland Branch, B.M.A.: Council.

OCT. 14.—Tasmanian Branch, B.M.A.: Branch.

OCT. 15.—Western Australian Branch, B.M.A.: Branch.

OCT. 22.—Victorian Branch, B.M.A.: Council.

OCT. 24.—Queensland Branch, B.M.A.: Council.

OCT. 30.—New South Wales Branch, B.M.A.: Branch.

OCT. 30.—South Australian Branch, B.M.A.: Branch.

OCT. 31.—Tasmanian Branch, B.M.A.: Council.

NOV. 5.—Western Australian Branch, B.M.A.: Council.

#### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

#### Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

**SUBSCRIPTION RATES.**—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.



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